July 13, 1942

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

ESTABLISHED 1882

BAILEY

HOT BLAST STOVES and OPEN JOINT CHECKERS

For complete description see pages 6 through 11 this issue.

LEADERSHIP THROUGH QUALITY

The BAILEY Open Joint Checker positively equalizes the flow of gases throughout the entire checker chamber due to complete cross-circulation. It is the only checker shape that guarantees such performance. Side passages from each flue have greater area than the flue itself, thereby forcing gases to flow across the entire checker chamber as well as through the vertical flues; this causes maximum turbulence—therefore maximum efficiency. Maximum brick weight in hot zones of stove. Stable construction due to column design and method of locking checkers.

WILLIAM M. BAILEY COMPANY

ENGINEERS

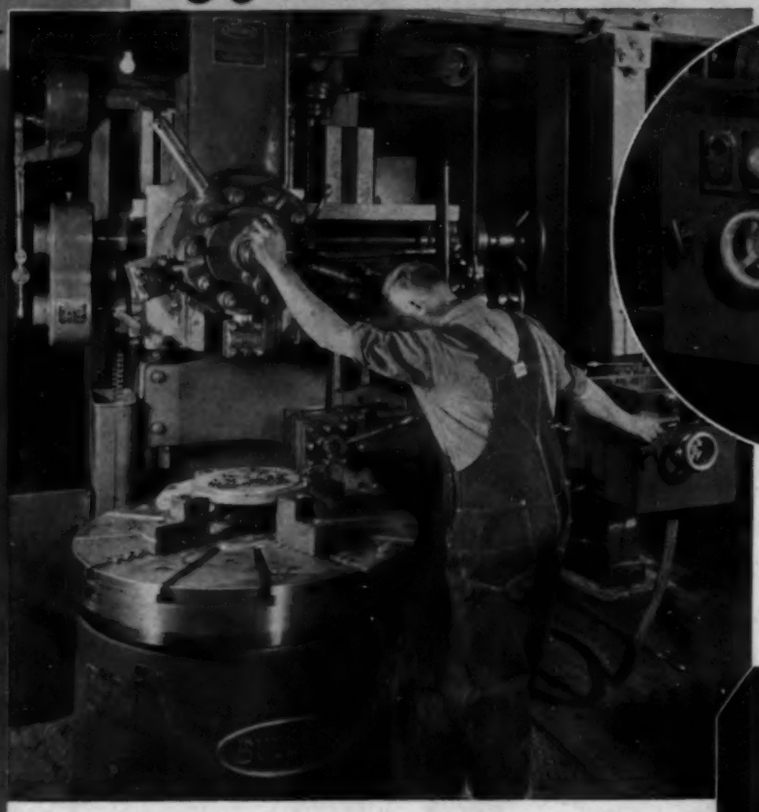
PITTSBURGH, PA.

With this EC&M Turret Lathe Control

CONSTANT "METAL REMOVED SPEED"

GIVES 50% MORE PRODUCTIVE CAPACITY

★ Control—only a small part of the cost, yet a vital factor in determining the efficiency of a machine. Here, control—only 7% of the total cost—makes output 50% greater, the equivalent of 2 machines doing the work of 3.



(Above) EC&M ball-bearing-equipped rheostat with fast-slow, stop, start-jog push buttons on cabinet-door. Rheostat is geared to side head tool holder for automatic operation. It can be disconnected for manual adjustment when desired.

WITH this unique turret lathe control the "metal-removed-speed" remains constant. This assures fast operation and use of the cutting tool at its rated capacity. It is accomplished by automatically increasing the speed or r.p.m. of the table as the diameter of the cut decreases. It results in increases as high as 50% in productive capacity.

For example, in machine-facing a 15" diameter casting, the same amount of metal per second is removed when the diameter of the cut has been reduced to 5" as at 15", because table-speed is three times faster than when first starting to cut at the 15" diameter. By this method of control, the *floor-to-floor time* per 15" diameter piece averages *5½ minutes compared to 10½ minutes* for machining a similar piece but under constant table-speed conditions.

The adaptability, ease of operation, convenience of push buttons and rheostat and maintenance of uniform cutting speed have resulted in increased productive capacity—*equivalent to another half machine according to the superintendent.* Full details sent upon request.

EC&M Line-Arc Magnetic Contactor, Dynamic Braking Controller with resistors completely wired and self-contained in ventilated enclosure on top of the controller-cabinet.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 E. 79th Street CLEVELAND, OHIO

FIGHTING FIRES before they start

Most fires are preventable. A smoldering cigarette, flipped carelessly into a dark corner . . . a welder's spark flying unnoticed into a pile of oily waste—these little things can, and do, start devastating fires.

At the beginning of the war emergency, recognizing that fire is a treacherous and deadly saboteur of production, Bethlehem intensified its attack on the fire hazard. As always, trained, fully-equipped fire-fighting forces supplied the backbone of the fire-control effort, maintaining day-and-night vigilance in every Bethlehem plant and shipyard.

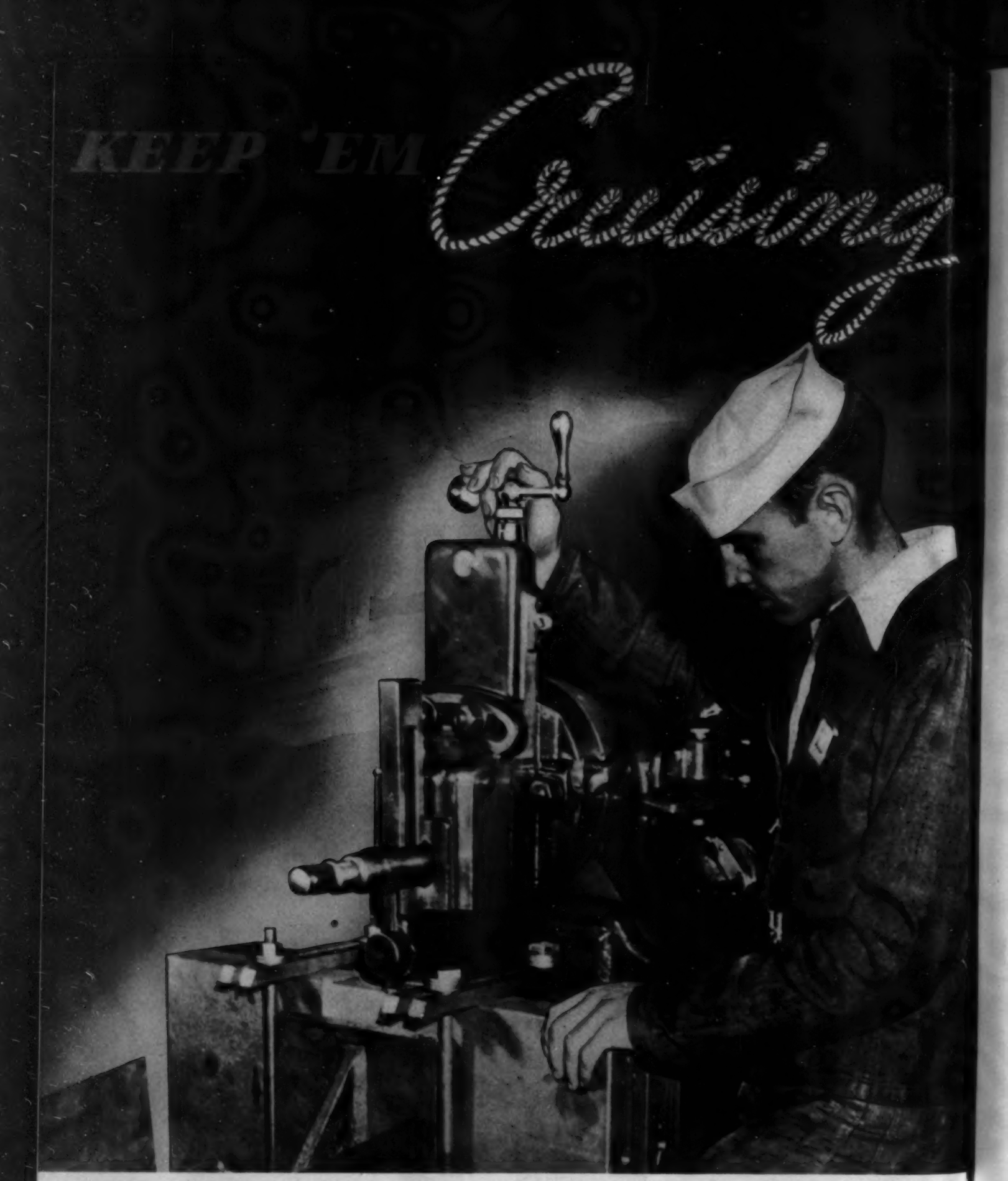
But to bring home the vital importance of fire prevention and control to every Bethlehem employee, we've designed a series of posters in full color and are displaying them in key locations throughout all Bethlehem shipyards and steel plants, which are now engaged in vital war work.

These posters are based on analysis of the most serious causes of fire and the all-important part of the human element in fire prevention. By pointing out to employees specific ways in which they can prevent or subdue fires, the posters are helping to minimize a potentially grave threat to the production of war materials.

Five of Bethlehem's series of fire-prevention posters. These posters are printed in full color. Each poster is designed to emphasize a specific problem in fire prevention or control.

BETHLEHEM STEEL

War-production plant executives who are carrying on fire-prevention campaigns may find these posters of interest. A complimentary set will be supplied on request to Bethlehem Steel Company, Bethlehem, Pa.



CINCINNATI SHAPERS, ashore and afloat, are helping to build and to maintain our battle fleets.

THE CINCINNATI SHAPER CO. • CINCINNATI, OHIO

OFFICIAL U.S. NAVY PHOTO

MODEL QM-15
Capacity 30,000 lbs.

MODEL 19518
Capacity 10,000 lbs.

Model 1614—capacity 30,000 lbs.

MODEL 19034
Capacity 12,000 lbs

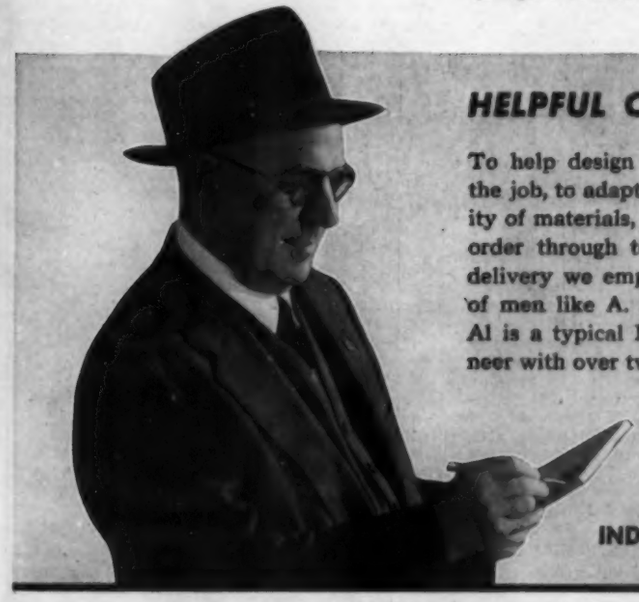
FOR IMMEDIATE ACTION!

ROLL YOUR LOADS on Trailers

ROCKER DUMP TRAILER
in Various Capacities

In new and converted plants a handling system using trailers is easy to set up, ready to go. Trailer haulage is adaptable to practically every job of moving materials, parts, waste, machines and heavy forms. Easton Trailers are rolling the loads everywhere along our industrial Beat-the-Axis front.

Easton Trailers are available (subject to PRP) for all purposes in capacities from 2,000 to 40,000 lbs. Easton can deliver wood or steel deck platform trailers, dump-body trailers, or specially designed trailers to meet unusual handling requirements. Two- or four-wheel knuckle steer, fifth-wheel steer, or caster type. Flat steel, solid rubber, or pneumatic tires. For manual or power haul, singly or in train. Timken bearing equipped.



HELPFUL COUNSEL ON YOUR TRAILER DESIGN

To help design your trailer to fit the job, to adapt it to the availability of materials, and to follow your order through to earliest possible delivery we emphasize the service of men like A. L. Schuller (left). Al is a typical Easton Sales Engineer with over twenty years experience covering all angles of industrial track and trackless haulage. For a free survey of your handling requirements, or for information on Easton Trailers to handle your loads, write to Engineering Counsel, Easton Car & Construction Company, Easton, Pa.

EASTON

INDUSTRIAL CARS • TRAILERS • ELECTRIC LIFT TRUCKS

Behind the Scenes with STEEL

It's You

■ Here's a little verse published by Reiger's Inc., Pittsburgh, which does a pretty good job of explaining why the grass across the street really isn't a bit greener than in your own backyard:

If you want to work for the kind of a firm
Like the kind of a firm you like,
You needn't slip your clothes in a grip
Or start on a job-hunting hike.
You'll only find what you left behind,
For there's nothing that's really new.
It's a knock at yourself when you knock your boss.
It isn't the firm. It's you!

No company's made by men who are afraid
Lest somebody gets ahead
When everyone works and nobody shirks
You can bring back a business that's dead.
And if, while you make your personal stake,
Your fellows can make one, too,
Your firm will be what you want it to be.
It isn't the firm. It's you!

Rivet Record

■ The labor relations division of the Maritime Commission is looking over the shipyards to find out whether or not there is enough riveting going on to encourage a contest among the gangs. A gang in the Oregon yard at Portland recently set a high mark, but it was soon eclipsed by a gang in Brooklyn employed at the Robins Dry Dock Co. Led by Riveter Sam Krysezun the Brooklyn gang set 2793 rivets in seven hours and 45 minutes, an average of six a minute throughout the working day.

But the chances of promoting a contest are not so good because riveting is going out of the picture. Eighty per cent of what used to be a riveting job is now welded. About all that is left of riveting is in repair yards, where ships built during World War I are undergoing repairs.

Beating The Promise

■ Incidentally, speaking of ships, a new world's record for ship construction was established last month by the Portland yard of Oregon Shipbuilding Corp. when the *Thomas Baily Aldrich* was completed in just 46 days from the time the keel was laid.

Telling All

■ A real job of "Tell All" advertising is this week's six-page story by William M. Bailey Co., Pittsburgh. With the front cover leading you to the details like a foxhound on the trail of his favorite dish, it really gives the blastfurnaceman what he wants to know. It's a swell job.

More On Design

■ Apparently we, or more correctly T. H. Beard of Bridgeport, Conn., started something with his letter June 29 on Industrial Designing. To carry on, let's hear from Robert Douglas of Boston.

Thanks to Mr. T. H. Beard, of Bridgeport, for his query, which opens the door for other comments on the subject of automobile design in the days which shall follow Victory and Peace. I am no engineer but a mere layman; but I have owned no less than 15 cars in my driving experience and feel that my opinions have at least the foundation of an average car-owner's experience.

Mr. Beard refers to the questionable engineering of the overhang on the post-war automobile. Will anyone tell me why we have to have this ridiculous overhang on our present cars? My brand new car (September 1941) had been less than 1000 miles when it was bumped in the rear, because of this needless overhang, and the repairs would cost $100 for cutting, welding and new parts, if materials and parts were available—which they aren't, so I shall have a sadly dented rear end on the car for the duration.

But it's the inside of the car that annoys me most. Consider the instrument board. In the good old days of simple indicating dials, we had white pointers and numerals and could read speed, fuel, and temperature without trouble. My present car (a good, well-known upper-middle class make) provides a good example of what we have been given by the Industrial Designers, in place of the good old readable dials. For a speed indicator I have a large silvered dial with engine-turned background; the figures are cut stencil-fashion through a metal rim, and the pointer, so help me, is also of silvered metal. Can you imagine a combination with less visibility? As for mileage, I have to put on my glasses to read the tiny indicator. Grouped around the speedometer dial are four small indicators, also worked out in silver and red with more of an eye for art than for quick visibility. (While we are on this subject, what is the use of the "Oil" indicator, anyway? Most motorists erroneously think it tells them whether they have oil in the lubricating system, not their oil pump pressure. Why continue to put it in cars when the non-technically minded car owner doesn't know what it is for or what to do about it anyway?)

Then we come to the matter of car windows! I have yet to drive in a modern car with "no draft" windows that was not ten times as drafty, for someone in the car, as cars used to be in the good old days of R. E. Olds! Not only is the modern car more drafty; my other objections include the fact that you can't get your head out of the window to do a careful job of backing or to read a sign, and also, if you are suddenly called on to open a window to make a hand signal, you will usually grab the wrong one of the handles, and then turn it the wrong direction—since the two knobs turn in opposite directions!

Finally, while I still have breath, you should see the heating and ventilating unit that is standard in my model. It has more rods to pull and handles to turn than the whole machinery of the old fashioned car required. (I'll admit this is an exaggeration!)

All of this long complaint sums up to this suggestion: when the motor manufacturers really begin to think about the post-war car, why not consult some car-users as to what they actually do like and don't like, do want and don't want? Why not try to build cars that consider the wishes of the buyers, instead of Industrially Designing something which the buyers must take and like, or else? I have driven for 25 years, as have most of my friends of my own age, and neither I nor any of them, to my knowledge, has ever been asked or heard of anyone else who has been asked, to offer a suggestion or opinion on the subject of car design.

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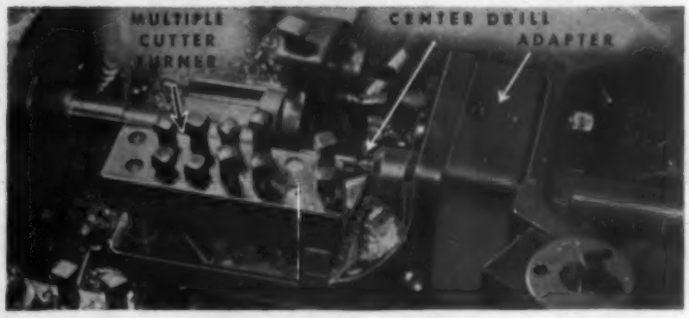
Buy a War Bond—Today!

Ideas for VICTORY

—from the Production Lines behind the Firing Lines—

He Found a Way to Eliminate an Indexing Operation



Two set screws hold the drill holder solidly in the adapter. The rolls of the multiple cutter turner act as a steady support for the bar as the drilling cut progresses.

Turret lathe operator Karl S. Dooley, at the Caterpillar Tractor Co., Peoria, offers an idea particularly valuable to the operator who has all six turret stations full and still requires a center drilling operation to complete the job in one chucking.

The photo shows how a centering tool was rigged up and held in the multiple cutter turner. The center drilling is performed at the same time the last of several finished diameters is turned.

It takes real initiative and ingenuity to work out a time-saving idea like this and we are proud to present operator Dooley with a gold Victory pin for his contribution.

Many practical "Ideas for Victory" sent in by operators are published in "Blue Chips", a shop bulletin sent by Warner & Swasey to the homes of turret lathe operators. Make sure your turret lathe operators and learners are on the list to receive "Blue Chips" Write Warner & Swasey, Cleveland, Ohio.

WARNER & SWASEY FOR VICTORY

YOU CAN TURN IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

THE BAILEY OPEN JOINT CHECKER

For Blast Furnace Hot Blast Stoves (Patented)

The Stove Checker With Complete Cross-Circulation Of Gases

THE BAILEY OPEN JOINT CHECKER has been designed to provide greater heating capacity at decreased cost in Blast Furnace Stoves. With the increased size and rate of blowing the modern blast furnace, more efficient stoves with greater heating capacity are a necessity. It is practically impossible to supply the desired heating capacity with standard bricks, using box type checker construction even with four standard sized stoves; whereas with the Open Joint Checker sufficient heating surface can be obtained with three stoves, thus saving the entire cost of the fourth stove and all auxiliaries. Most of the Special Shapes offered have not only been defective in design but have been too expensive for the heating surface obtainable. The Open Joint Checker Shapes not only have a comparatively low initial cost but the Labor Cost of laying these shapes has proven to be exceptionally low comparatively.

The Bailey Open Joint Checker has the proper shape and structural strength to carry the load; to absorb and give off the heat; to build into a stable structure in the checker chamber at minimum labor cost and to provide maximum heating surface per cubic foot of space. When compared with standard box type construction or other special shapes of the same sized flue, the cost per square foot of heating surface is less, thus giving economy as well as efficiency.

The checkers are placed in the stove to form continuous columns from bottom to top of checker chamber. Each checker is interlocked with adjoining checkers at all four corners and each course of checkers is locked into the adjoining courses. This interlocking of the courses is accomplished initially by making the bars of the Steel Bottom, on which the checkers are supported, alternatively high and low. All checkers are locked around the shell wall by means of Key Brick, which not only lock each brick securely in place, but close up the side passages, so that the gas cannot get through to side walls.

The space between checkers or key bricks and brick side walls is filled with suitable shapes of fire brick bonded with Lumnite in bottom half of stove and Air Setting Cement in upper half of stove as shown on cross-sectional drawing. This method of construction makes it impossible for the checkers to twist or work out of position, since each and every brick is locked horizontally and vertically and solidly backed with brick against the side walls.

INDIVIDUAL BRICK DESIGN FOR DIFFERENT ZONES IN STOVE

REASONS FOR SHAPE DESIGNS

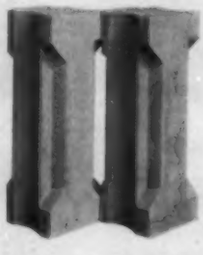
1. Temperature difference between gas and checker surface in different zones.

2. Velocity of gases and its influence on heat transmission rate; the rate increases as the .8 power of the velocity above 600 ft. per minute and remains practically constant below this velocity.

3. Turbulence has a decided influence on heat transmission rate by bringing the gases into more intimate contact with heating surface.

INLET CHECKER

This brick is designed to allow maximum quantity of gas to enter flues with proper shape and weight to withstand the severe punishment of high temperature and velocity.



TOP CHECKER

This brick is designed to give large brick weight per cubic foot of checker chamber volume in order to take advantage of the high heat transmission rate caused by the high temperature, turbulence and velocity of gases, without sacrificing benefits of cross-circulation. This brick has a uniform cross section to withstand rapid temperature changes. As the heating period advances the top checkers become gradually "soaked" or attain the same temperature as the gas. This shape, therefore, is designed for large heat storage capacity, which is an advantage in carrying high hot blast temperature for long periods.

STRAIGHT CHECKER

This brick gives larger heating surface per cubic foot but with less weight than Top Checker and is ideal for the intermediate and bottom sections of the stove, where the gas has been reduced to less than one-half the initial flame temperature, so that heating surface becomes more important than weight. This shape maintains the straight flue with the long vertical side openings, facilitating cross-circulation and increasing turbulence without increasing resistance unnecessarily.

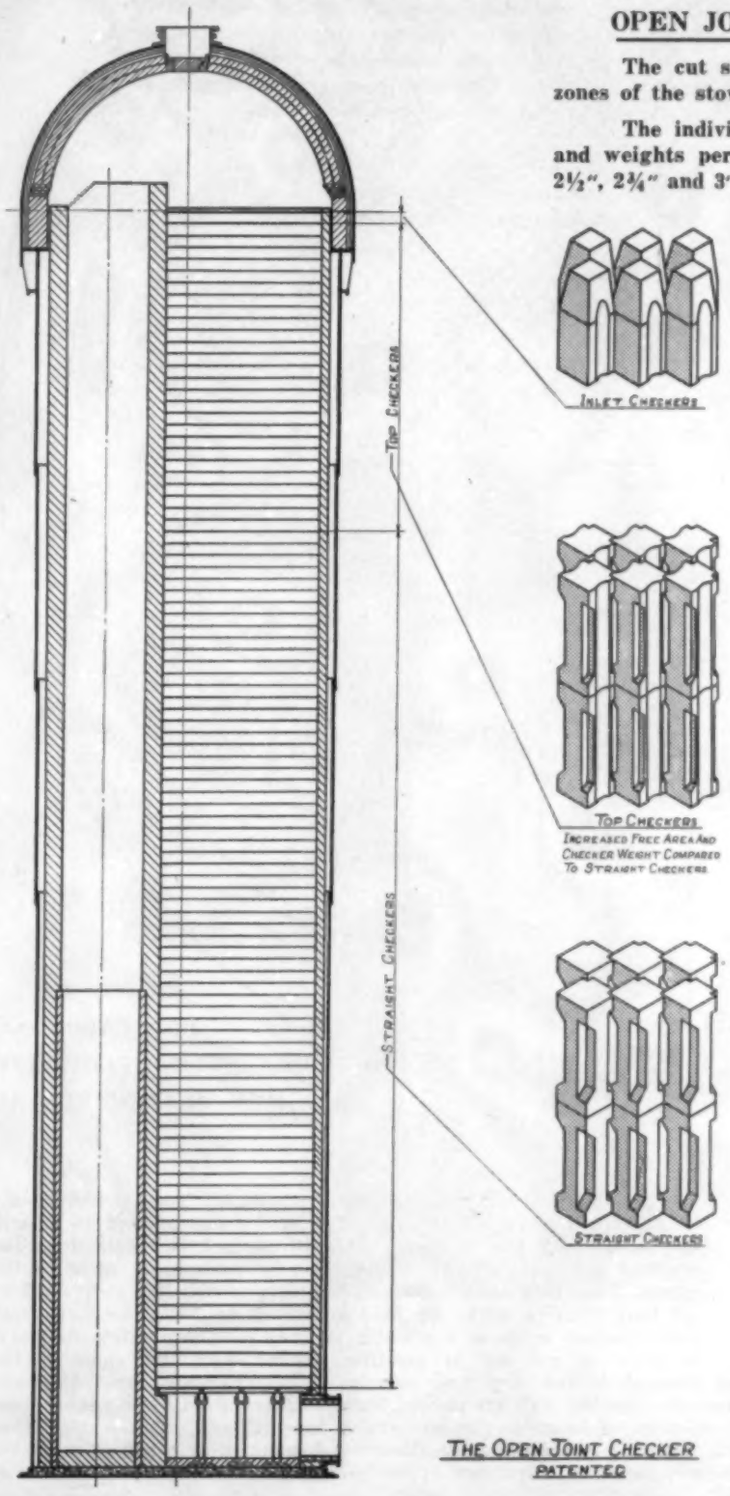
WILLIAM M. BAILEY COMPANY • ***Engineers*** • **PITTSBURGH, PA., U. S. A.**

BLAST FURNACE STOVE DESIGN

HEMISPHERICAL DOME -:- TELESCOPIC SHELL

THE Stove Shell is of welded or riveted construction with a Special Dome design which allows the brick side walls to move up or down as they expand or contract without interference with the dome brick, and also eliminating all pressure against the dome of the steel shell. The dome is insulated with no air space between shell and dome, so that when dome is subject to blast pressure, brick work will not open up and permit blast to blow through to steel shell.

The Telescopic Shell was designed and patented by us. This type of shell construction enables the builder to increase the thickness of the insulation in the hot zones of the stove as required without decreasing the thickness and thereby weakening the brick shell wall.



THE OPEN JOINT CHECKER
PATENTED

OPEN JOINT CHECKER DESIGN AND DATA

The cut shows the various checker shapes and indicates the zones of the stove in which they are used.

The individual brick weights, heating surface per cubic foot and weights per square foot of heating surface are given for the 2½", 2¾" and 3" Flue Checkers.

INLET CHECKERS

TOP CHECKERS
INCREASED FREE AREA AND CHECKER WEIGHT COMPARED TO STRAIGHT CHECKERS

STRAIGHT CHECKERS

WEIGHT OF BRICK SHAPES

Pounds

Flue	2½"	2¾"	3"
INLET	11.6	13.1	14.7
TOP	12.4	14.3	15.7
STRAIGHT	11.1	12.7	14.5

WEIGHT OF BRICK PER CUBIC FOOT OF VOLUME

Pounds

Flue	2½"	2¾"	3"
INLET	79.0	77.0	75.5
TOP	84.3	84.2	80.6
STRAIGHT	75.6	75.0	73.7

SQUARE FOOT HEATING SURFACE PER CU. FT. VOLUME

Flue	2½"	2¾"	3"
INLET	6.27	6.06	5.68
TOP	7.35	6.71	6.30
STRAIGHT	8.31	7.69	7.16

WEIGHT OF BRICK PER SQUARE FOOT OF HEATING SURFACE

Pounds

Flue	2½"	2¾"	3"
INLET	12.6	12.7	13.2
TOP	11.5	12.6	12.8
STRAIGHT	9.2	9.8	10.3

ALL WEIGHTS GIVEN ARE FOR FIRST QUALITY BRICK.

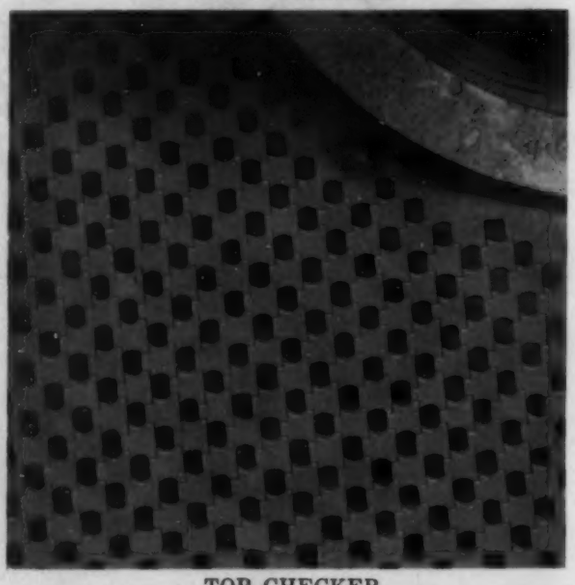
If de-aired first quality or Super Duty is used, weights increase approximately 6% to 7½%.

WILLIAM M. BAILEY COMPANY • *Engineers* • PITTSBURGH, PA., U. S. A. *(Turn Page)*

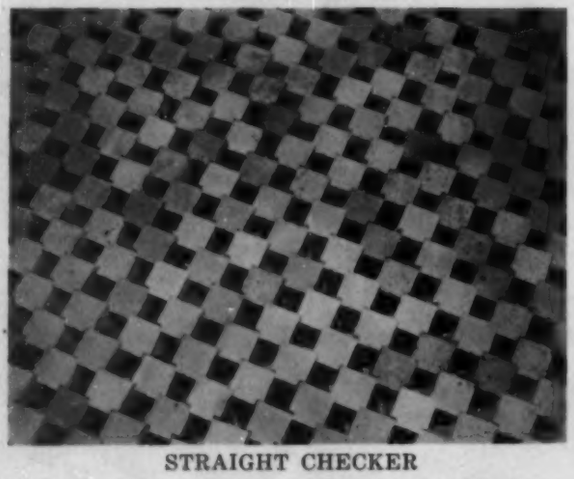
THE BAILEY OPEN JOINT CHECKER

CROSS SECTIONAL VIEWS OF VARIOUS SHAPES AS LAID IN 24 FT. STOVE

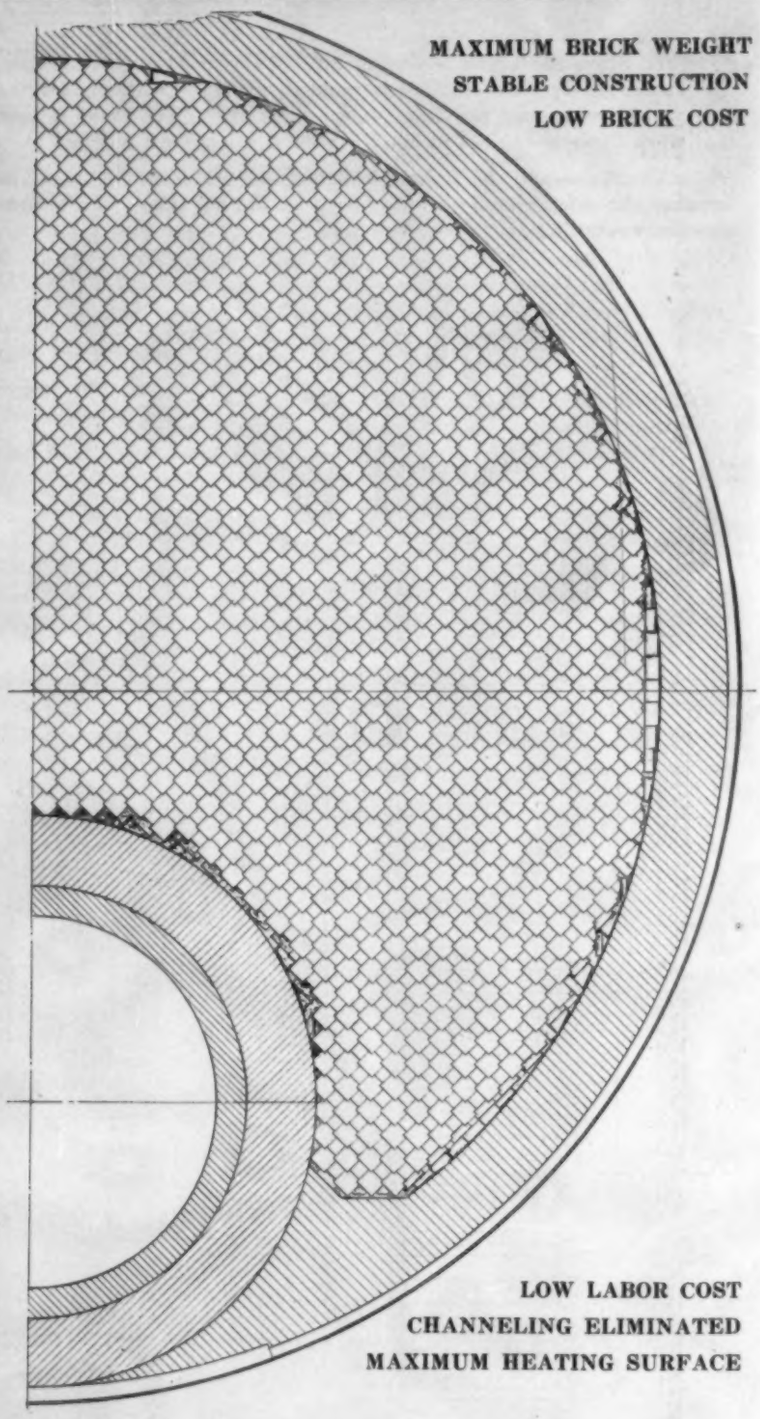
INLET CHECKER



TOP CHECKER



STRAIGHT CHECKER



MAXIMUM BRICK WEIGHT
STABLE CONSTRUCTION
LOW BRICK COST

LOW LABOR COST
CHANNELING ELIMINATED
MAXIMUM HEATING SURFACE

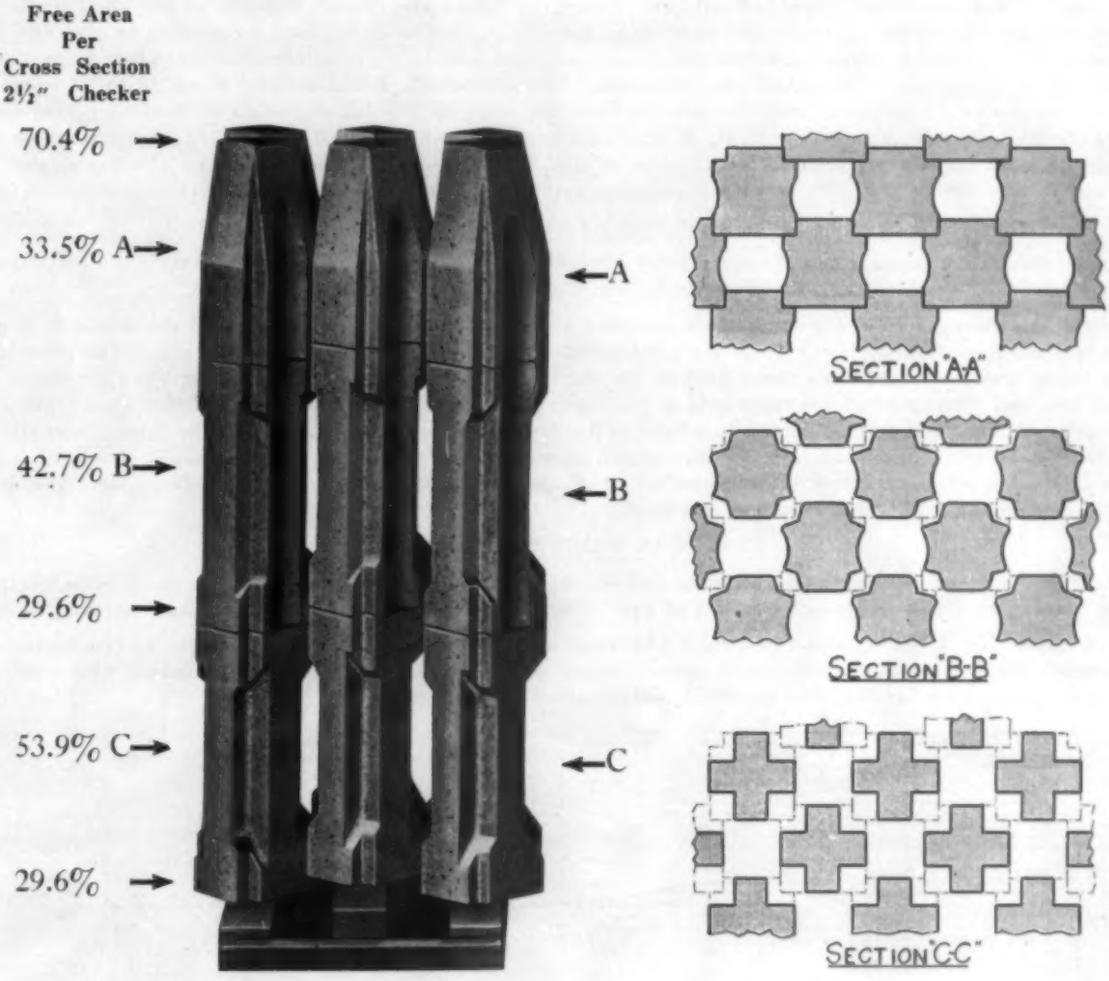
A STUDY of the cross-sectional cuts on this page shows plainly the large brick volume. The bricks are shaped to absorb the heat, but the large heating surface is obtained by the vertical side passages throwing 90% of each brick open to the gases. They also show how each and every brick has a ¾" lock on all four corners with the four adjoining bricks. The Keys lock each checker brick at the walls, so that it is impossible for them to twist or get out of position. These keys also close up the vertical side passages, so that the gases cannot get through to the ring wall or combustion chamber wall. All voids between checkers and keys and the ring wall or combustion chamber wall are packed tight with standard brick shapes such as feather edge and splits and all joints filled with a mixture of Lumnite (or air setting cement) and ground brick, thus forming a solid wall between checkers and shell wall. There is no necessity to allow for expansion or contraction at the walls, since the checker brick are laid up dry and there is sufficient allowance at the joints of each brick to take care of the expansion and contraction of each individual brick.

WILLIAM M. BAILEY COMPANY • ***Engineers*** • **PITTSBURGH, PA., U. S. A.**

BRICK AND FLUE AREA COMPARISONS

THE illustration at the left shows the three types of checkers stacked in the order in which they would be placed in a stove. It shows the column construction and also the long open joints which make free circulation between flues easy. The open joints are formed by the cut-backs at the corners of the bricks. These cut-backs are sloped 45° at top and bottom ends to deflect gas flow into adjacent flues in such a way that turbulence is set up. The figures at left indicate free areas at ends and middle of each type of checker. The area of the side passages is greater than the area of the flue itself, thus guaranteeing cross-circulation. This larger free area at open joints permits the gas to expand thus increasing turbulence of flow and efficiency of heat transmission.

The cut at the right is a cross-section taken at the center of each type of brick. The actual brick volume is shown by the shaded sections and the actual flue area is shown in clear white. It also shows the relatively short distance between adjacent flues. These cuts show the solid volume of clay in each type.



GENERAL CONSIDERATIONS IN LINING HOT BLAST STOVES

THERE are many factors to be considered when the Blast Furnace Superintendent and Engineers discuss the building of new stoves or the relining of old stoves to suit the blast furnace they are to serve. However, the total amount of heating surface desired is generally of first importance and should be determined by consideration of the following facts and requirements:

1. Capacity of blast furnace or volume of wind blown;
2. Hot blast temperature to be maintained;
3. Cleanliness of gas to be burned in stoves;
4. Stove efficiency desired.

Knowing the volume of wind and the hot blast temperature, the total quantity of heat to be stored by the stoves is determined; also the volume of gas to be burned in each stove may be calculated, based on approximate B. T. U. content of gas and stove efficiency.

The next step is to decide the size of flues to be used in checker chamber. If dirty gas is available flues 4" and over are generally selected; if primary cleaned gas (approximately .10 to .25 grains of dust per cu. ft.) straight flues 2-¾" to 3-¼" may be used, depending on effectiveness of gas cleaning equipment; finally, if secondary cleaned gas (.05 grains of dust per cu. ft. or better) is available flues 2-¾" and under should be used. Since even the best gas cleaning equipment may fail for short periods of time, a cleanable flue should be selected in preference to an extremely small holed checker design, which cannot be cleaned effectively. Where old stoves are relined, the size of the shell limits the total heating surface possible of installation while in building new stoves, size of stoves may be selected to give any maximum efficiency desired. By providing good stove insulation and sufficient heating surface, efficiencies ranging from 85% to 90% may easily be obtained without excessive size of stoves. Such efficiencies would require about 15 to 20 square feet of heating surface per cu. ft. of gas burned. In order to keep the stove on gas for any specified heating period each sq. ft. of surface should have sufficient brick weight. If an insufficient weight is provided the heating period must be shortened accordingly or more surface provided per square foot of gas burned to obtain good efficiency. The Open Joint Checkers are designed to give the desired results with the proper weight per cubic foot for the customary heating period.

CROSS-CIRCULATION OF GASES

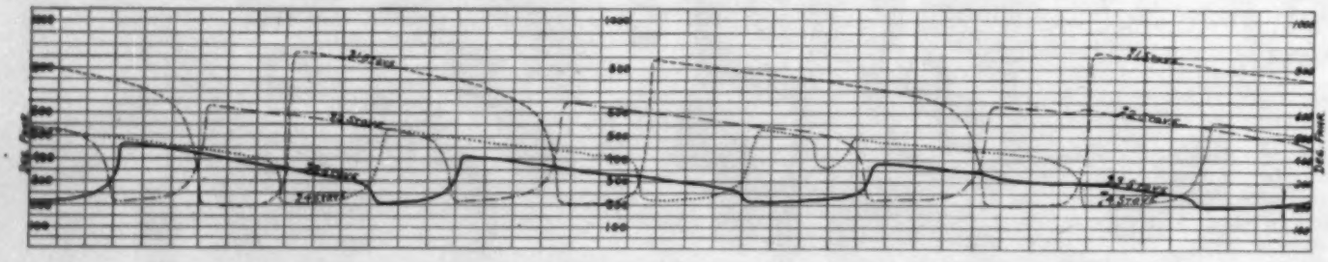
One of the main objections to the conventional straight flue checker is "channelling" of the gas in passing through the checker chamber, which causes a large percentage of the heating surface to be ineffective.

As the gas emerges from the combustion chamber at a high velocity and impinges on the dome, it is guided by the dome into the flues farthest away from the combustion chamber. Thus most of the gas enters the checkers at this point and would travel straight down these flues to the stack were there no cross-circulation between the flues. However, because of the long side openings characteristic of the Open Joint Checker, the gas being under pressure will follow the path of least resistance and quickly spread to adjoining flues until an even flow exists in all the flues. Even with an even flow established the gas will expand into the open joints, because of the greater area at this point, thus setting up turbulence and increasing effectiveness of heating surface. The open joints have no horizontal surfaces for collection of dirt. No flue can clog for more than the length of one brick.

FLUE GAS TEMPERATURE CHART

Recorded by 4-point continuous recording instrument on 4 blast furnace hot blast stoves of same overall dimensions, and burning approximately same quantity of gas. Time on hot blast in proportion to surface contained in each stove.

Please note No. 3 Stove, with Open Joint Checkers, absorbs the heat much more readily at the beginning of the heating period, the stack temperature rising approximately 50° F. the first half hour as compared with 200° F. on the stove with the same sized flue and 300° to 400° F. on the other stoves.



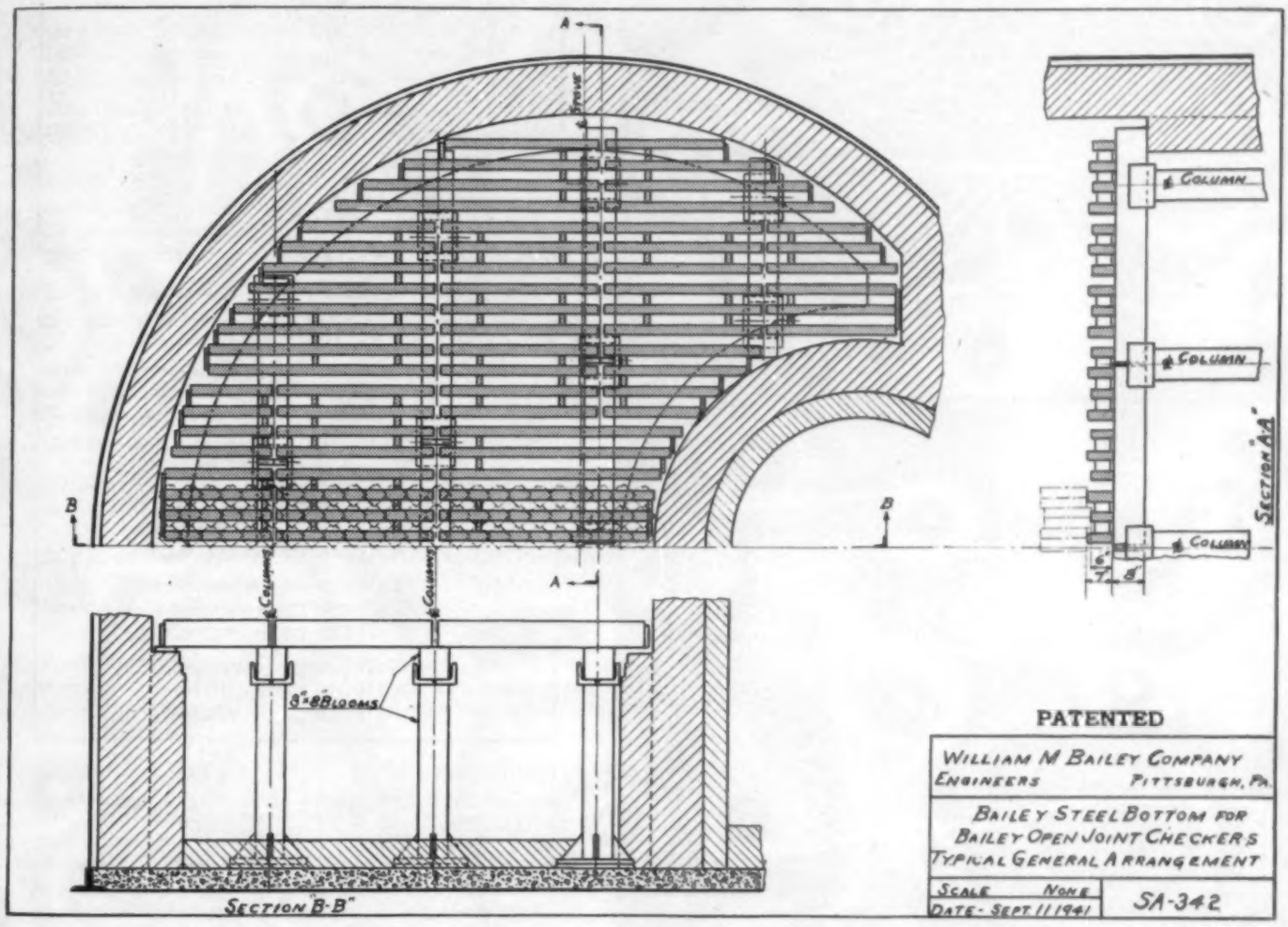
No. 1 Stove	4½" sq. flues	45,000 sq. ft.	heating surface.
No. 2 Stove	3½" sq. flues	75,000 sq. ft.	heating surface.
No. 3 Stove	3 " sq. flues	100,000 sq. ft.	heating surface.
No. 4 Stove	3 " sq. flues	90,000 sq. ft.	heating surface.

No. 3 Stove has OPEN JOINT CHECKERS

WILLIAM M. BAILEY COMPANY • *Engineers* • PITTSBURGH, PA., U. S. A.

FABRICATED STEEL BOTTOM FOR HOT BLAST STOVES

THE Fabricated Steel Bottom, as designed for use with the Open Joint Checker, is fabricated from heavy rolled steel sections. All steel members are in themselves of uniform thickness and are exceptionally heavy for the load they are required to carry and the maximum temperature they are required to withstand. Each member is free to move independent of all other members. All steel members are of such length, weight and shape that there is no possibility of the Bottom and the brickwork being damaged by warping or expansion of the steel at maximum temperature obtained. Construction of the grid members is such that they may be adjusted to suit the first course of checkers so as to obtain a free flow of air and gas to and from the checker flues. Due to our Open Joint Checker design, unburned gas will not pass down through any flue continuously to the bottom but will flow to adjoining flues so that complete combustion is always effected before reaching the bottom of the stove, thereby eliminating any secondary combustion at this point.



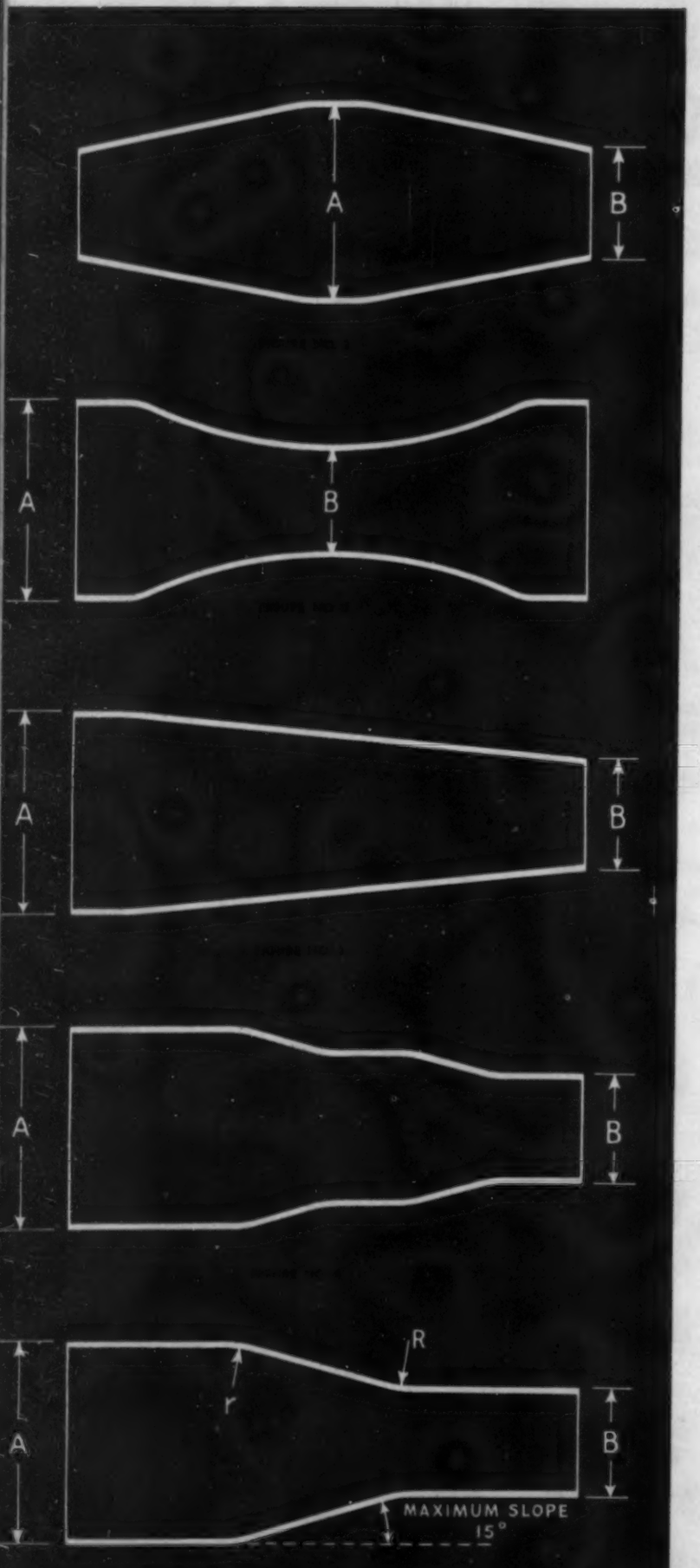
Forty to fifty-five tons of standard rolled steel products used instead of brick.

Exceptionally Heavy Members - Low Erection Cost.

USE YOUR OWN PRODUCTS IN YOUR OWN STOVES!

WILLIAM M. BAILEY COMPANY • *Engineers* • PITTSBURGH, PA., U. S. A.

Configured



RANGE OF SIZES, GAUGES AND REDUCTIONS POSSIBLE

(This applies to present equipment working tubing made of low carbon steel. Alloy steels will take less reduction and non-ferrous metals will take greater reduction.)

Original O.D., Inches—(A)	Gauge (B.W.G.)	O.D. Can Be Reduced to Approximately, Inches—(B)
4	8	2¾
4	10-12-14	2½
3½	10	2⅛
3½	12-14	2⅛
3	10	1⅞
3	12-14-16	1¾
2½	12-14-16	1½
2½	18	1⅜
2	12-14	1¼
2	16-18-20	1 9/16
1¾	14	1 1/16
1¾	16-18-20	1 1/16
1½	14	1
1½	16	15/16
1½	18-20	13/16
1¼	16	¾
1¼	18-20	11/16
1	18-20	9/16

WALL THICKNESS CONTROL POSSIBLE

(In the range from 1¾" O.D. x 16 gauge to 3" O.D. x 12 gauge, in sizes listed above.)

% Reduction of O.D.	Wall Control
10% to 15%	Wall will be increased 10% to 15% No other control possible
25%	Wall can be increased 25% Wall can be maintained Wall can be decreased 5%
35%	Wall can be increased 30% Wall can be maintained Wall can be decreased 20%
45%	Wall can be increased 35% Wall can be maintained Wall can be decreased 30%

On sizes smaller than 1¾" O.D. x 16 gauge, present equipment is confined to increasing or maintaining original wall.

On sizes larger than 3" O.D., full control cannot be obtained, but maintenance of wall thickness and slight increase or reduction are possible.

Any diameter intermediate to those above can be configured, and gauges lighter or heavier than shown can be worked, providing required reductions are less severe. In gauges heavier than those listed, it is difficult to maintain and impossible to decrease the wall thickness. Analysis of the steel may cause some variation in the above figures, which are based on low carbon steel.

RADIUS LIMITATIONS

(See Figure No. 5 at left)

Minimum Radius (r) = ½" on 4" O.D.
= ½" on 3" O.D.
= ¼" on 2" O.D.
and smaller sizes

Minimum Radius (R) = 2" on all sizes

Tubing

—NOT A "CURE-ALL," BUT A VERY EFFECTIVE AID FOR THE RELIEF OF MANY DESIGNING AND FABRICATING HEADACHES

After years of application to countless products, which have been improved through the high strength to low weight ratio and the ornamental effect of tubing, there is no question as to the merits of this shape. In some instances, however, designers and engineers may have hesitated to apply tubing to their designs, and fabricators may have helped discourage the use of tubing in these instances, because of the excessive cost and difficulty of fabricating odd or unusual shapes.

This handicap now is largely eliminated by CONFIGURED TUBING—tubing already formed to shape. And it not only makes odd shapes practical and holds costs within acceptable limits—it also can effect a substantial saving in the cost of tubular parts heretofore fabricated by other methods—it provides a means by which tubing can be used for parts previously made from solid bars.

To provide engineers and fabricators with facts and figures which will enable them to estimate the possibilities of CONFIGURED TUBING for their individual products, we present the diagrams and tables on the opposite page, together with the following brief description of this unusual product:

CONFIGURED TUBING is produced by a new, patented process of cross rolling. It can be formed to almost any contour obtainable on solid bars in a lathe, the limitations being sharp corners, sharp radii or undercuts, which cannot be formed by cross rolling. It should be understood, too, that the cross-section of the part must be circular throughout.

From the sketches on the opposite page, it will be seen that any style of taper can be formed. The photograph at the right illustrates a very few of the irregular shapes produced.

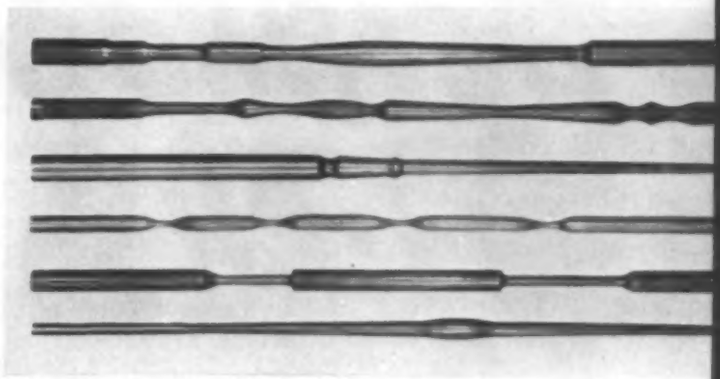
In addition to formation of contour, wall thickness can be controlled while the tube is being processed. It can be thinned for reduction in weight or thickened to increase strength—even thickened sufficiently for forging at the ends of the part. The tables on the opposite page show the degree of wall control obtainable—the limitation of reduction of outside diameter of the tubing—and the minimum radii possible.

With present equipment, tubing up to 4″ O.D. with a maximum wall thickness of .165″ can be configured in lengths up to 20 feet. This means that long tapers which cannot be swaged can be formed by this process. The smallest limit of finished size is 9/16″ O.D. by .049″ wall. Tolerance of diameter can be held to approximately ±.010″ when Republic ELECTRUNITE Tubing, with its consistent uniformity in diameter, wall thickness, concentricity and temper, is used. Since configuring usually is performed cold, physical properties are materially increased.

Why not investigate the possibilities of CONFIGURED TUBING *now?* Maybe some tubular part you are using can be formed better, faster or cheaper. Maybe a part made of CONFIGURED TUBING would be more desirable than some part now made from a solid bar. Maybe CONFIGURED TUBING will hold the answer to a new design. Steel and Tubes engineers are ready to offer suggestions—to help you in every way possible.

STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
CLEVELAND • OHIO

Berger Manufacturing Division • Niles Steel Products Division
Union Drawn Steel Division • Culvert Division • Truscon Steel Company



A few samples of CONFIGURED TUBING are shown above. Typical applications include aileron torque tubes, landing gear struts, and other airplane parts—metal furniture parts such as legs and standards—architectural details, nozzles, venturi tubes and injectors—manifolds, horns, gearshift link rods, robe rails and other automotive parts. The possibilities for many other applications seem very favorable.

REPUBLIC STEEL PRODUCTION FOR VICTORY

Republic

ELECTRUNITE

Reg. U. S. Pat. Off.

ELECTRIC RESISTANCE WELDED TUBING

GETTING "SOFT" ... EH?

"BEWARE of an America aroused!"

Sure we've been rolling on rubber—eating our sirloin steaks—lolling in the luxuries which only free Americans have the God-given genius to create, and the capacity to enjoy. But we can still take it, and we can still dish it out.

The world knows now that this "love of luxury" is just a thin outer garment, easily whipped off in an emergency—and that, underneath it, there are muscles of steel.

Sacrifice? We will sacrifice anything but our Liberty!

Suffering? We still remember about Valley Forge, and the blood of our fathers on the snow!

Death? Better death, any day, than life without freedom!

So they said we'd rather lose a war than lose an election? And those cracks, dividing us, were deep craters—not just surface scratches? Management wouldn't work with men, and men wouldn't work with management? And we couldn't get going *fast enough* to become a real factor in this war?

What a jolt the Axis is in for! You might just as well try to sweep the tide back with a broom as try to buck American machines, driven by free, skilled American workers.

◆ ◆ ◆

Inspired by the job our own workers are doing, we view this crisis, not with alarm—but with confidence. Every lathe, every drill, every tool in our plants has been turned into a weapon of war—every worker, man or woman, into a PRODUCTIONEER—a soldier in overalls. Such spirit, such skill, such strength cannot lose—for these men and women are fighting *with their hearts,* as well as with their heads and their hands—fighting, along with the millions of other patriotic workers throughout all America—to STAY FREE!

LINK-BELT COMPANY—INDIANAPOLIS—PHILADELPHIA—CHICAGO—ATLANTA—DALLAS—SAN FRANCISCO—CEDAR RAPIDS
THE LEAD NG MANUFACTURER OF EQUIPMENT FOR HANDLING MATERIALS AND TRANSMITTING POWER
Reprints in 4 colors furnished on request. Address: 307 N. Michigan Ave. Chicago.

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COPPER TUBING
THE ARTERIES OF OUR FIGHTING MACHINES

Airplanes and battleships, submarines, destroyers and cargoships, tanks and turrets, trucks and jeeps—they all feed on gas, air, oil, water, steam or chemicals . . . steadily flowing through giant arteries of copper.

Tough and tenacious, withstanding high pressure and corrosion . . . copper tubing is one of the elements of which victory is built.

LEWIN-MATHES TUBING
OF COPPER OR GILDING METAL

LEWIN MATHES

LEWIN-MATHES COMPANY • • SAINT LOUIS, MISSOURI

WEIRITE

pledge of maintained quality

Experience has convinced Weirton customers that their purchases of WEIRITE Tin Plate and allied steels may be made with unquestioning confidence. For WEIRITE is more than a tin plate of uniform gage, ductility and coating . . . WEIRITE reflects a maintenance of quality keyed constantly to the changing needs of modern production. WEIRITE buyers know this for what it is — a pledge — and have responded with purchases which maintain Weirton unchallenged as the world's largest independent tin plate producer.

LIST OF PRODUCTS

Bars . . . Angles . . . Structurals . . . Piling . . . Hot and Cold Rolled Strip . . . Hot and Cold Rolled Sheets . . . Galvanized Sheets . . . Long Terne Sheets . . . WEIRITE Cold Reduced Tin Plate . . . Terne Plate —Special Coated and Roofing Ternes . . . Tin Mill Black Plate . . . Lacquered Tin Plate and Black Plate.

WEIRTON STEEL COMPANY—WEIRTON, WEST VIRGINIA

Sales Offices in Principal Cities

division of NATIONAL STEEL CORPORATION

Executive Offices, Pittsburgh, Pa.

HERE COMES THE "DOCTOR OF BALANCE"!

A portable unit which answers the need for balancing large rotating parts under actual operating conditions.

PORTABLE WATTMETER TYPE BALANCING MACHINE

Product of The Westinghouse Research Laboratories

NOW, in two convenient carrying cases, you can bring the balancing equipment to the machine . . . to locate, measure, and correct unbalance in rotating parts at their rated speeds . . . on their own bearings . . . under actual working conditions.

Using a simplified balancing procedure known as the "Wattmeter" method, this unit records both amplitude and phase angle of vibration, enabling you to determine the points of unbalance and corrective weights needed. Available for balancing parts operating at speeds between 100 and 10,000 RPM.

Not to be considered a production machine with other Gisholt Balancing equipment, the Portable Unit is recommended for use in checking proper balance at the time of installation and for maintenance of large rotating parts of special design made in small lots. Literature on request.

Metering unit is self-contained, protected in carrying case.

Sine Wave generator shaft and pick-up unit.

GISHOLT

GISHOLT MACHINE COMPANY, 1217 East Washington Avenue • Madison, Wisconsin

LOOK AHEAD . . . KEEP AHEAD . . . WITH GISHOLT IMPROVEMENTS

TURRET LATHES · AUTOMATIC LATHES · BALANCING MACHINES

AS IMPORTANT AS THE FUSE IN YOUR POWER LINE--

SAFETY SLIDE IN THE FERRACUTE *Automatic* PIN CLUTCH

The Clutch Slide or Driving Dog on the Ferracute Automatic Pin Clutch is a specially engineered SAFETY DEVICE. Made of Alloy Steel, carefully heat treated, the Slide will give you years of service under normal conditions. It is designed, however, to break when the press is dangerously overloaded---thus preventing more serious damage to press, dies, or to operator.

The Safety Slide does the same job as the fuses in your power line---and is as easily replaced since it is round and can, in an emergency, be made in any machine shop. It is one more engineering feature that keeps FERRACUTE presses on the firing line without interruption.

The Ferracute Automatic Pin Clutch is a complete, compact unit of clutch and brake assembled together---an exclusive feature, found on no other press. It is standard equipment on all the small and medium sizes of the famous FERRACUTE PRESS line.

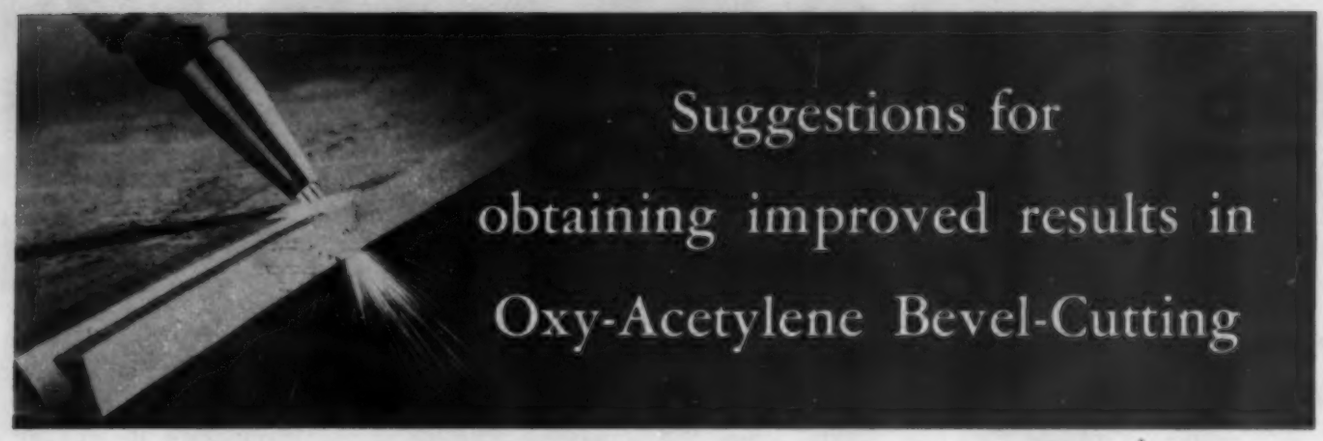
FERRACUTE MACHINE COMPANY

Bridgeton, New Jersey, U. S. A.

AS EASY TO REPLACE AS A FUSE

TRADE FERRACUTE MARK

PRESSES *and* PRESS BRAKES



Suggestions for obtaining improved results in Oxy-Acetylene Bevel-Cutting

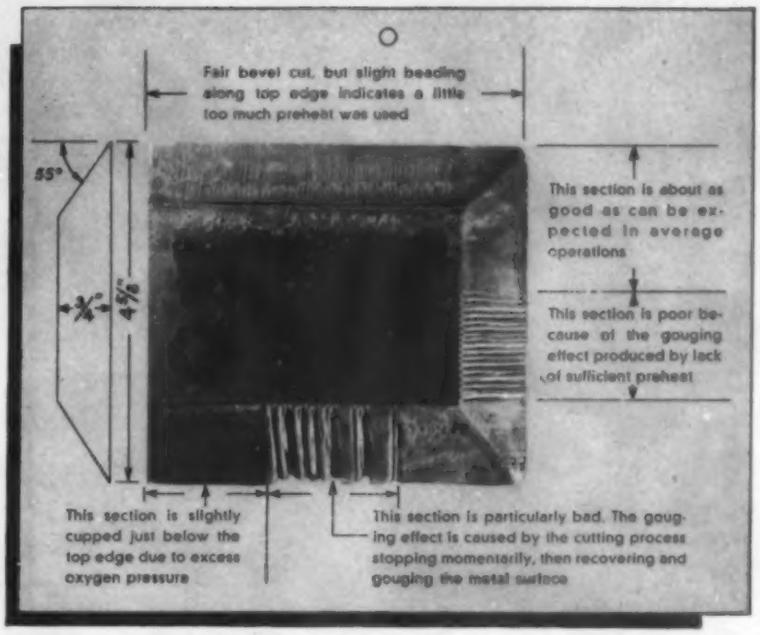
IN the preparation of plate edges by means of oxy-acetylene flame-beveling, accurate adjustment of the preheat flames—as well as correct cutting speeds and nozzle sizes is extremely important in obtaining uniformly good results. Illustrated at the right are some test bevel-cuts which show this better than words can describe. To help operators do consistently good work, large-size wall charts showing these test cuts are available from any Linde office, without charge.

More Preheat Required

In many cases, poor bevel-cutting results are directly due to insufficient preheat. The reason that more preheat is required for bevel-cutting than for vertical-cutting is that, with the nozzle at an angle to the plate surface, the heat tends to "bounce off" and does not soak in to the same extent as when the preheat flames strike the plate at right angles. The flatter the angle, the greater the amount of preheat required.

How to Increase the Preheat

For beveling angles up to 45 degrees, sufficient preheat can be obtained with standard nozzles by slightly "forcing" the preheat flames. For very shallow angles, it is sometimes necessary to provide supplementary preheat, either with a second blowpipe, or by first going over the line to be cut with the preheat flames of the cutting blowpipe.


Fair bevel cut, but slight beading along top edge indicates a little too much preheat was used
55°
4⅝"
¼"
This section is about as good as can be expected in average operations
This section is poor because of the gouging effect produced by lack of sufficient preheat
This section is slightly cupped just below the top edge due to excess oxygen pressure
This section is particularly bad. The gouging effect is caused by the cutting process stopping momentarily, then recovering and gouging the metal surface

You can obtain a large-size (9 by 11 inches) wall chart of the above cutting guide from any Linde office, upon request. Ask for Form 5067.

Nozzle Size and Pressures

In bevel-cutting, the actual *depth* of the cut should be considered, rather than *plate thickness*, when selecting the nozzle, and when setting gas pressures and cutting speeds. The Instructions which came with your blowpipe will guide you in this. Duplicate copies of Instructions for apparatus supplied by Linde can be obtained from any Linde office.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

General Office: New York, N. Y. UCC Offices in Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

LINDE OXYGEN . . . PREST-O-LITE ACETYLENE . . . UNION CARBIDE
OXWELD, PUROX, PREST-O-WELD APPARATUS . . . OXWELD SUPPLIES

The words "Linde," "Prest-O-Lite," "Union," "Oxweld," "Purox," and "Prest-O-Weld" are trade-marks of Units of Union Carbide and Carbon Corporation.

When you gotta jump—you gotta jump! It's great to have that feeling of confidence that comes from knowing every part of the 'chute is as trustworthy as human hands and machines can make it.

Confidence in all equipment for defense—in its superiority and dependability—instills the victory spirit in our armed forces.

Indirectly helping to build this confidence is our big job—competently handled by veteran springmakers with a record earned in peace-time for springs and small stampings of integrity.

Wallace Barnes Company

DIVISION OF ASSOCIATED SPRING CORPORATION

BRISTOL, CONNECTICUT, U. S. A.

Barnes-made Springs *for Victory*

The WEAN ENGINEERING COMPANY, Inc. • WARREN, OHIO

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

ARMOR PLATE LEVELLERS

HI-SPEED SHEET AND TIN MILL SHEAR LINES

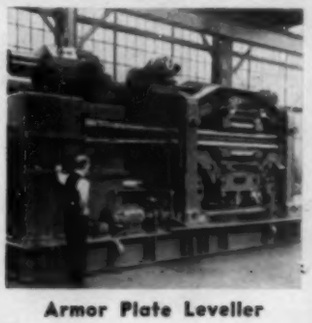
ELECTROLYTIC & BONDERIZING TIN PLATE EQUIPMENT

WILSON TUBE ANNEALING FURNACES

WEAN VACUUM CUP SHEET AND PLATE LIFTERS

CONTINUOUS STRIP PICKLING, SLITTING, SIDE TRIMMING, AND RECOILING LINES

Shell and Sleeve Lathe



Armor Plate Leveller

Wilson Tube Type Annealing Furnace

Wean Vacuum Cup Sheet and Plate Lifter

For Victory!

IN PLANTS CONVERTED TO WAR WORK

Do Your Motors Match The Job?

New work for machines means new loads on motors. Make this MOTOR FITNESS TEST a basic point in your conversion program. It will help you to get the most out of each machine—to achieve peak output sooner, and to forestall future shutdowns.

General Electric Co.
Sect. 750-140D, Schenectady, N. Y.
Yes, send me the Motor Fitness Manual, GEA-3873.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____ STATE_____

CITY_____

Motor Fitness Manual

for plants converting or already converted, to war production. Tells what to do to get the most out of motors, old or new. If you're undertaking new work on motor-equipped machines, if you're "switching" motors from one job to another, or equipping machines with new motors—you'll find here helpful facts to save your time. Write for a copy.

MAKE THIS

MOTOR FITNESS TEST

1 WHEN YOU SHIFT a machine to war work, even if there is no real change in the type of work the machine will be doing—

☐ *Check motor conditions.* Examine bearings, insulation, wiring connections. Clean the motor thoroughly inside and out.

THE G-E MOTOR FITNESS MANUAL TELLS HOW

2 IF YOU RELOCATE the machine, or change other machines nearby—

☐ *Check power supply.*

☐ *Check on physical protection of the motor.* If an open motor, particularly one of older design, make sure it is safeguarded against entry of chips, cast-iron dust, excessive coolant.

☐ *Recheck alignment and mounting arrangement* to prevent vibration and rapid bearing wear.

THE G-E MOTOR FITNESS MANUAL TELLS HOW

3 WHEN YOU BEGIN the first trial run on new work—

☐ *Measure voltage and determine ampere value* under load with a hook-on volt-ammeter or other load-analyzing instrument.

☐ *Check motor starting characteristics,* making sure that the motor comes up to speed promptly.

THE G-E MOTOR FITNESS MANUAL TELLS HOW

4 AS YOU PLAN new operating schedules—

☐ *Review the motor lubrication and maintenance routine* to be sure it will receive regular attention at intervals in keeping with the new duties.

THE G-E MOTOR FITNESS MANUAL TELLS HOW

5 SHOULD YOU FIND motors now in service inadequate for the job—

☐ *Get in touch with your local G-E motor representative,* who will advise you as to whether they should be repaired, rebuilt, or replaced. *Don't wait for motor trouble which may delay production before taking this step.*

AND REMEMBER—If new motors are required to meet present-day conditions, G-E Tri-Clad motors in standard, open construction (1 to 100 hp) are generally available without delay for high-priority war jobs.

The Navy "E" for Excellence has been awarded to 92,750 General Electric employees in ten plants manufacturing naval equipment.

BUILDER OF TRI/CLAD MOTORS

REG. U.S. PAT. OFF.

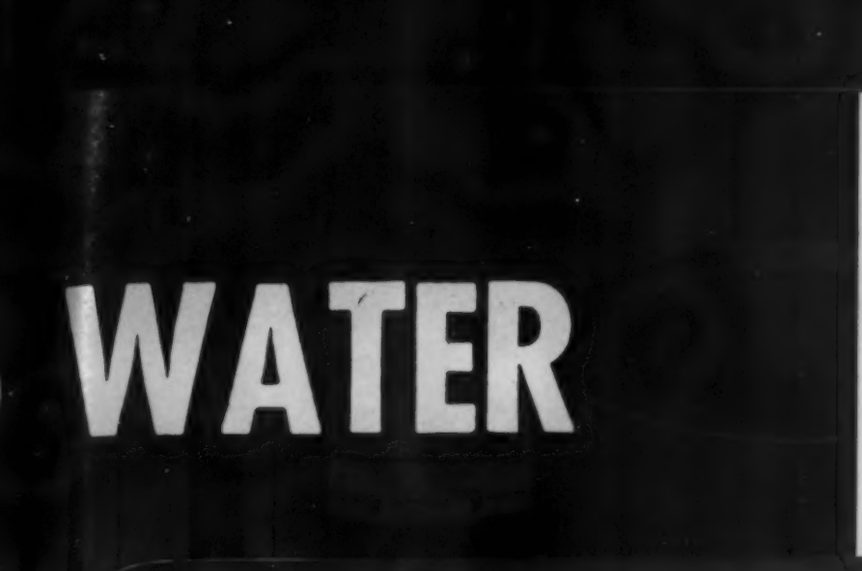
GENERAL ELECTRIC

PLUS ? PARTS

DON'T GIVE RUST A TOE-HOLD. Keep your plant painted. Once rust gets started it is extremely difficult to make paint stick.

A MORE DURABLE PAINT JOB. These two samples of galvanized steel were exposed in Florida for 18 months. No. 2 was Bonderized U·S·S Paint-bond and shows little sign of deterioration. But look at No. 1 . . . 90% of the paint has peeled from the surface, leaving the galvanizing exposed.

PLUS HOW MANY PARTS WATER? Leaky roofs can destroy vital war materials as effectively as sabotage. Make sure that *all* plants, warehouses and store rooms are weather-tight.



Maintenance is a necessary part of the war program

IT'S going to be a long time before you get a new plant—so you should take every precaution to protect your present structure.

Fortunately, the government has recognized the necessity of careful plant maintenance and ear-marked a certain percentage of steel roofing and siding for this use. Before allowing your plant to get into a run-down condition, investigate the possibilities by calling your local distributor of U·S·S Steel Products. He can tell you whether or not any maintenance steels are available.

One of the best types of steel to use for repairs is U·S·S Paintbond. This is a galvanized sheet with a Bonderized surface that prevents chipping or peeling of paint. Paint lasts longer, gives better protection. Repair work can be painted immediately without a messy acid etch. In the South and West, the special steel sheet for quick painting is known as U·S·S Dul-Kote.

Where uncoated sheets are specified, U·S·S Copper Steel gives double or triple the resistance to atmospheric corrosion and costs but little more. Copper steel also holds paint better than plain steel because it forms a tighter oxide which does not flake readily.

Remember that rust is a destroyer second only to war, and take the steps necessary to keep your plant in first-class condition.

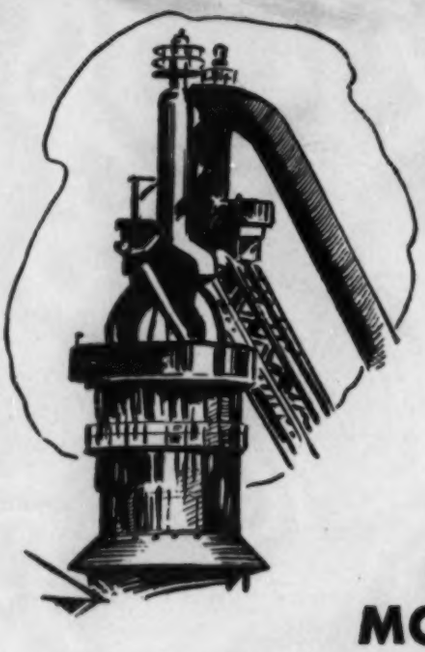
U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
Scully Steel Products Company, Chicago, *Warehouse Distributors* · United States Steel Export Company, New York

USS

UNITED STATES STEEL

PRITCHARD
CONDITIONED BLAST



$H_2O + C \rightarrow H_2 + CO$
Requires Heat

Pritchard Conditioned Blast Maintains This Reaction Constant

RESULTS:
INCREASED CAPACITY
MORE UNIFORM PRODUCT

DESIGN FEATURES:

Greater Economy...Fewer Critical War Materials Required

For Full Details and Complete Design and Construction Service, write—

J·F·PRITCHARD & CO·

DWIGHT BLDG. KANSAS CITY, MO.

BRANCH OFFICES IN TULSA, OKLA. HOUSTON, TEXAS
ATLANTA, GA. CHICAGO, ILL. PITTSBURGH, PA. NEW YORK CITY

LAMSON & SESSIONS' BOLT AND NUT PRODUCTS

for Aircraft

AIRCRAFT PRODUCTS
manufactured by
LAMSON & SESSIONS

AN3—to AN16—Hex Head Bolts, Aircraft, Steel
AN23—to AN36—Clevis Bolts, Aircraft, Steel
AN310—Nuts, Aircraft, Castle
AN315—Nuts, Aircraft, Plain
AN316—Nuts, Aircraft, Check
AN320—from—6 to—20, Nuts, Aircraft, Shear
AN325—Nuts, Aircraft, Plain Hex, Fine Thread
AN330—Nuts, Castle, Fine Thread
AN335—Nuts, Plain Hex, Coarse Thread
AN340—Nuts, Machine Screw, Coarse Thread
AN345—Nuts, Machine Screw, Fine Thread
AN380—Cotter Pins, Stainless Steel
AN380—Cotter Pins, Carbon Steel, Cadmium Plated

Products manufactured on direct orders in production quantities only

AN3DD—to AN16DD—Hex Head Bolts, Aluminum Alloy
AN23DD—to AN36DD—Clevis Bolts, Aluminum Alloy
AC60—Bolts, Hex Head, Fine Thread
AC65—Bolts, Hex Head, Coarse Thread
AC70—Bolts, Carriage
AN73—to AN81—Bolts, Aircraft, Engine
AN393—to AN396—Clevis Pins, Aircraft, Steel
AN355—Nuts, Slotted, Engine
AN360—Nuts, Plain, Engine
AC500—AC501—Screws, Fillister Head, Aircraft
AN505—AN510—Screws, Flat Head, Aircraft
AN515—AN520—Screws, Round Head, Aircraft
AN525—AN526—Screws, Button Head, Aircraft
N. A. S. Close Tolerance Bolts
Phillips Recessed Head Screws

Please state priority rating on all inquiries.

Illustrated here are a few of the Lamson aircraft products made to latest Army and Navy specifications in every respect. They are manufactured by our Aircraft Products Division housed in two of our five plants. Modern equipment of every kind needed for such specialized production has been installed to meet increasing demands. Metallurgical, chemical and physical testing laboratories are the most complete in our industry in both equipment and trained personnel. An inspection organization exists which has no superior in any industry. Latest type physical testing apparatus includes spectroscopes, salt spray testing facilities, and magnetic testing equipment. We operate our own wire drawing, heat treating, plating and anodizing departments. Obviously, foresight combined with experience enabled Lamson & Sessions to be well into production when war became a declared fact and therefore Lamson aircraft products manufacturing was in an "all out" offensive when war struck. It continues, night and day.

Distributors of Lamson Aircraft Products

Aircraft Hardware Mfg. Co., Inc., 1381-91 Lafayette Avenue, Bronx, N. Y.
Supply Division, Inc., Lambert Airport, St. Louis, Mo.
Screw Products Corp., Ross Avenue, Dallas, Texas
★ Union Hardware & Metal Co., Los Angeles, Calif.

★Hex Head and Clevis Bolts only

THE LAMSON & SESSIONS COMPANY • 1971 West 85th Street • Cleveland, Ohio
Plants at Cleveland and Kent, Ohio; Chicago and Birmingham

LAMSON & SESSIONS

BOLTS · · NUTS · · COTTERS · · CAP SCREWS · · SPECIALS

Your Jobber Stocks the Lamson Line

THEY'RE TOUGHER!

YET

MACHINE EASIER!

Heppenstall Hardtem Die Blocks

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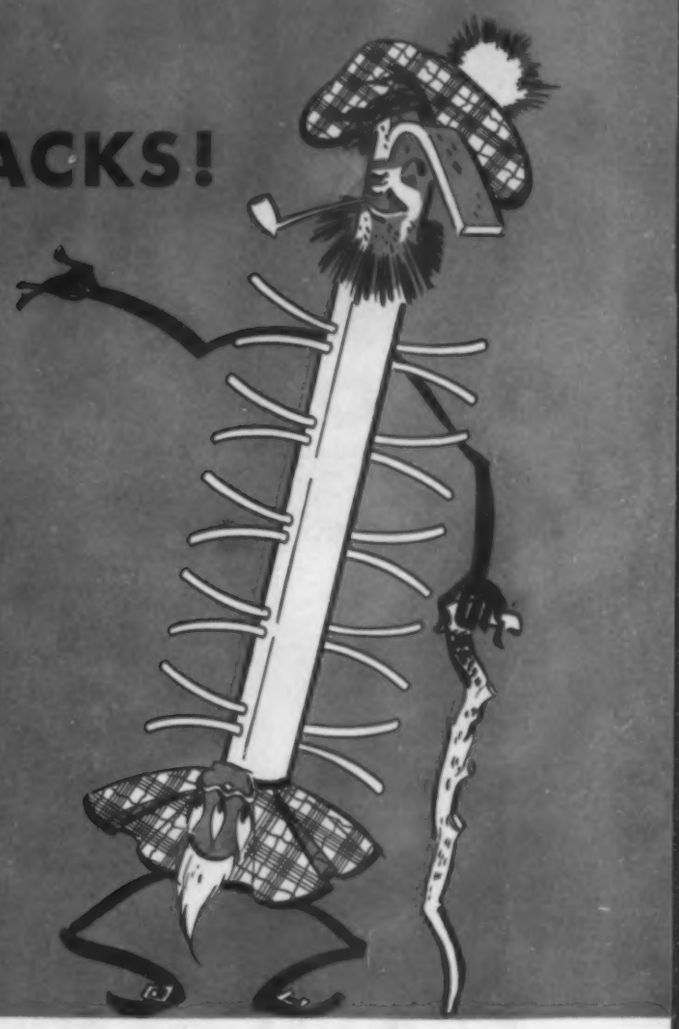

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SAVE TIME...

SAVE METAL...

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WANT TO REDUCE frequent recoating of plating racks and fittings? Want a tough, flexible coating that can be speedily applied in your own shop? Want to avoid waste deposits of valuable metal on racks and fittings?

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Steel castings containing vanadium have a higher elastic ratio than castings without vanadium but of otherwise like composition and heat treatment. At the same time, the vanadium castings possess at least equal ductility in tension and a considerably higher impact strength and wear resistance. Grain size is smaller and more uniform, while grain growth at heat treatment temperatures is retarded.

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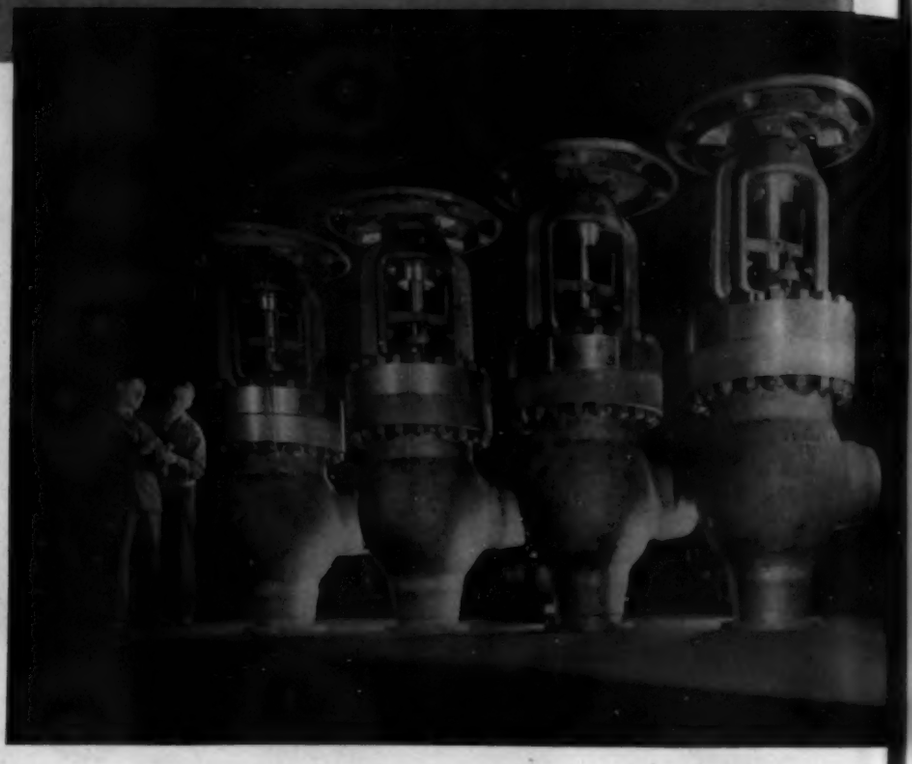
Man-Size Valves of CAST STEEL



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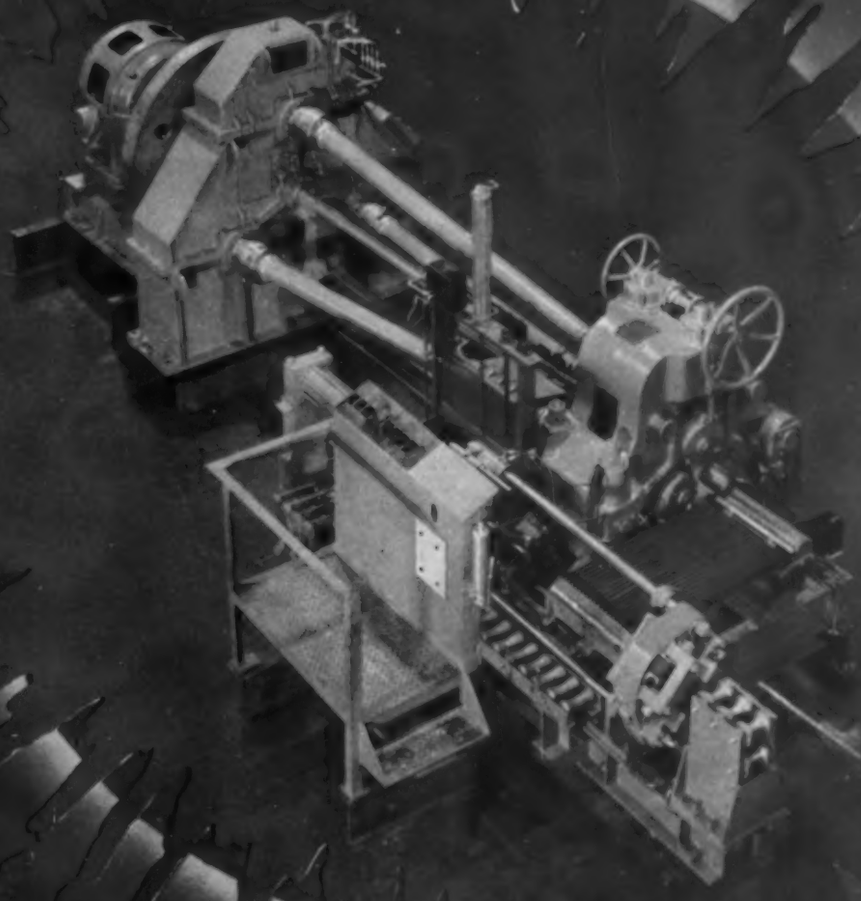

Witter Mills have rolled peak hourly productions as . . . . . .

425 75 m.m. 290 105 m.m.

220 155 m.m.

(from actual records)

Let us explain how you can start with a minimum weight billet or 25% less steel and eliminate the rough machining operation.

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We do not know the ultimate destination of the Plates rolled from these Ingots,—but, we do know that every length of Worth Steel Plate will do its bit toward that glorious Victory to come,—for Ships, Tanks, Railway Cars, Boilers of various sorts, Unfired Pressure Vessels, and a thousand and one other products (using steel plate in their construction)

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Operation as a "So-Called" triple action using the cushion.

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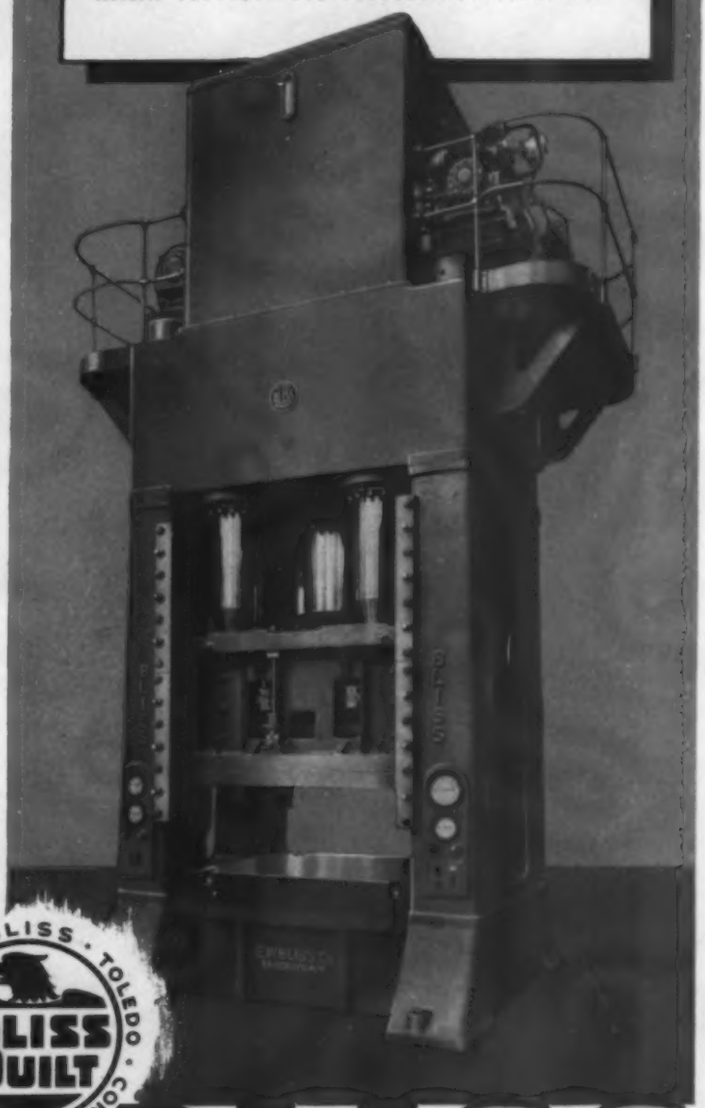
Capacity of frame	1000
Capacity of punch slide	650
Capacity of blankholder slide	350
Capacity of cushion	150
DIMENSIONS—INCHES	
Bed area F to B X R to L	60x74
Cushion pads—two each	34x32
Draw and liftout capacity	14
Maximum blank size	50x58
Maximum punch size	40x60
PRESS SPEEDS—INCHES PER MINUTE	
Quick advance to work	450
Pressing	30½
Return	375



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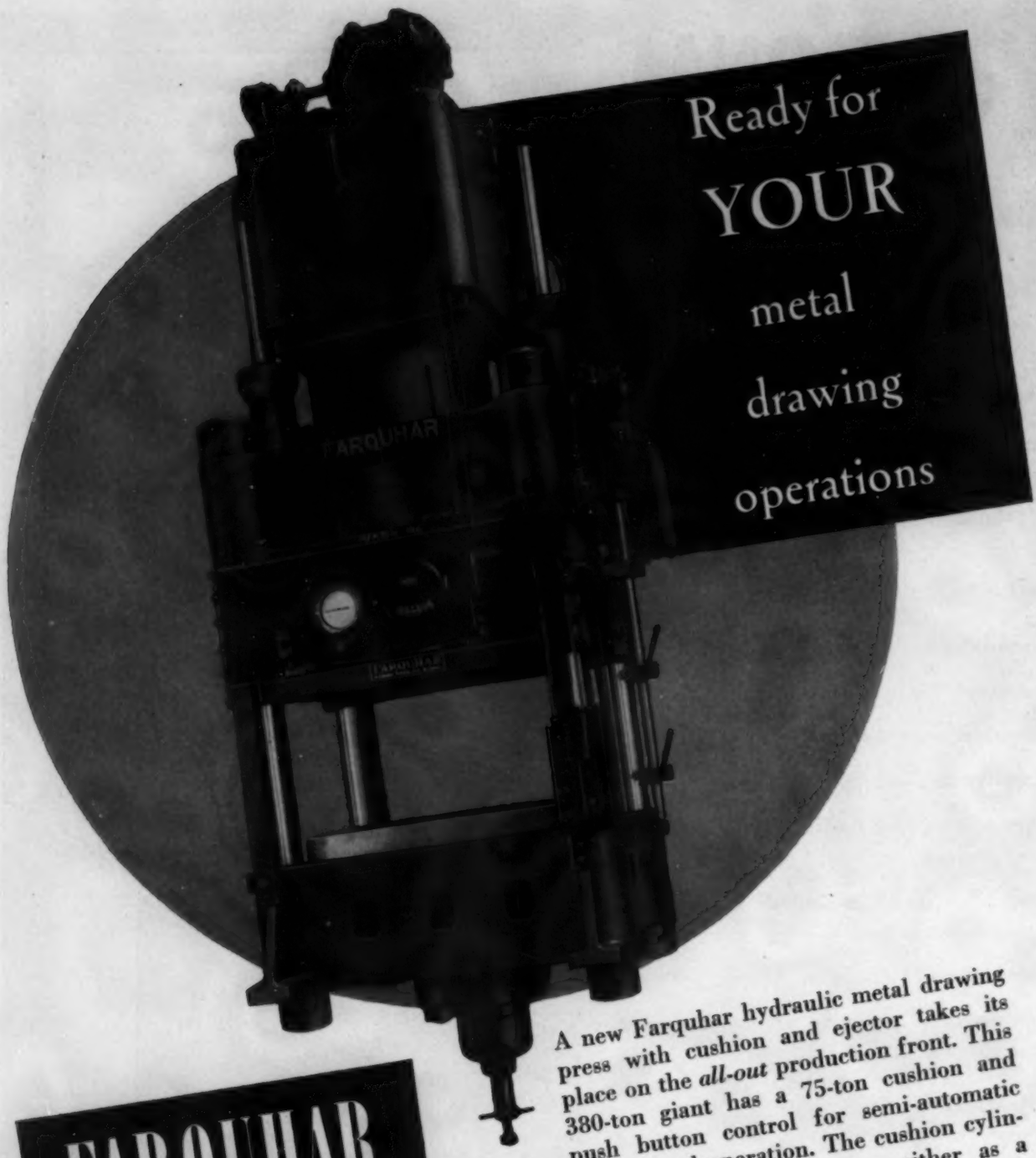

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A new Farquhar hydraulic metal drawing press with cushion and ejector takes its place on the *all-out* production front. This 380-ton giant has a 75-ton cushion and push button control for semi-automatic and manual operation. The cushion cylinder is arranged to operate either as a cushion or an ejector . . . with separate, independent pressure adjustment of the cushion. Daylight, 24 inches; stroke, 18 inches. Bed measures 42¼ inches clear, left to right, 36 inches front to back. For details, write Hydraulic Press Division of A. B. Farquhar Co., Limited, 195 Duke St., York, Pennsylvania.

Farquhar builds high speed hydraulic presses for all types of metal working . . . from 3 to 7,200 tons capacity.

OEM Photo by Palmer, in an Allegheny Ludlum plant

. . . But Not to Hitler's Taste

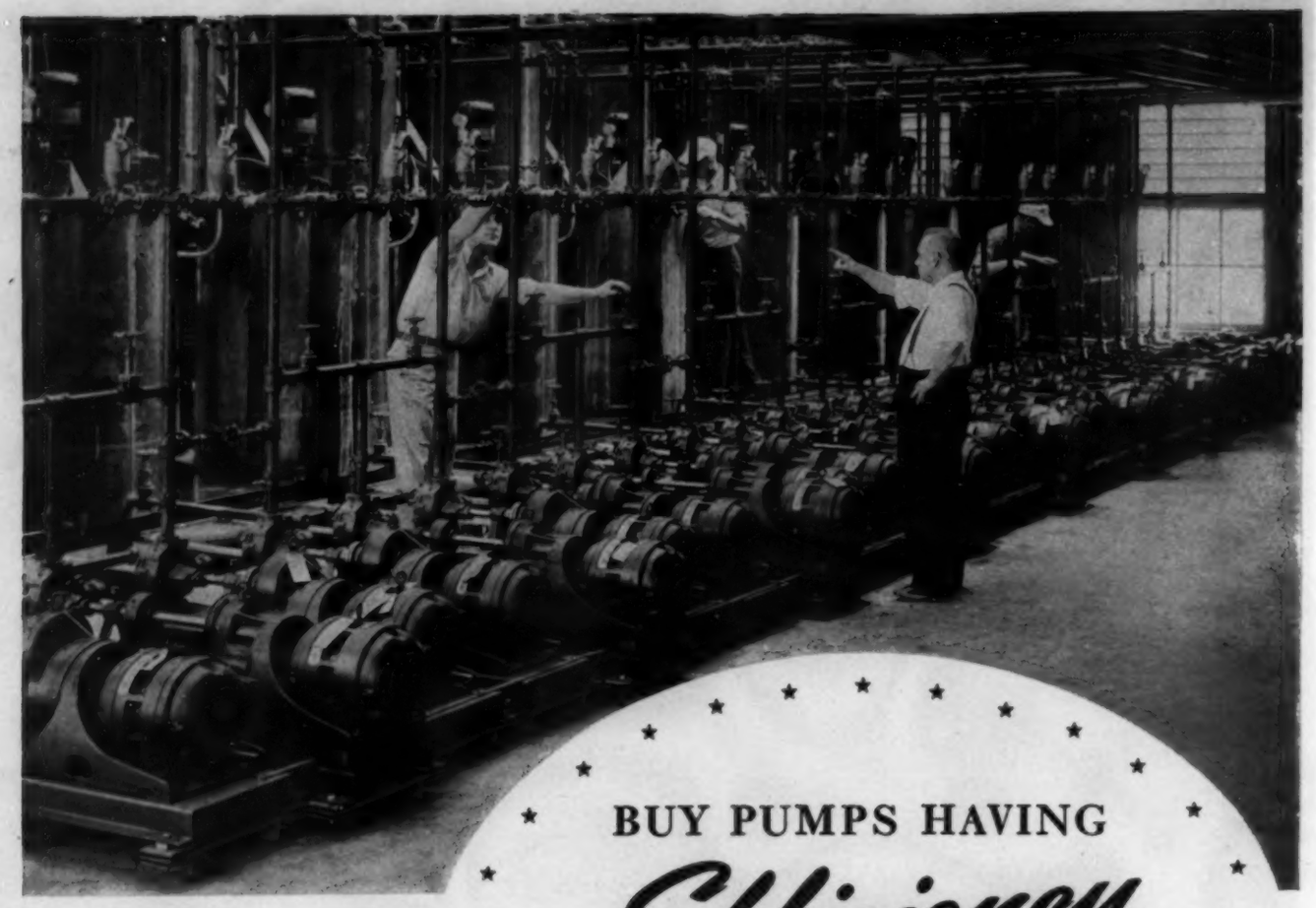
WAR'S emphasis is on *strength,* in men and in steel. That trite little truism is all pictured for you above, where the last admixture of alloys is going into an Allegheny Ludlum electric furnace.

In the shortest possible time after the arc is struck, that batch of alloy steel will be war material in use. It may be stainless bomb racks or ammunition chutes; tool steels fashioning a tank; valves or nitrided shafts in engines; electrical steels in gun and engine controls. Whatever it is, Hitler definitely won t like the taste of it. Nor will Tojo.

But let's make sure it takes the least amount of time to turn out these finished war goods. And let's not waste, unnecessarily, a single pound of vital alloys in the process.

To help engineers and production men toward more efficient fabrication and use of alloy steels, and to aid in the instruction of training classes, we have developed a wide list of printed aids. They're especially valuable for assisting "conversion" plants to avoid pitfalls and get under way. Just tell us your alloy steel problems, and let us help you find the answers.

Allegheny Ludlum
STEEL CORPORATION
GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA



These 36 F-M motor-driven rotary pumps in a large manufacturer's paint mixing room serve distant paint spray booths.

BUY PUMPS HAVING

Efficiency

That's More Than Skin Deep!

THOSE pumps you are about to buy for war production—will they serve you efficiently not only now but also through the years to come?

They will if you choose Fairbanks-Morse Pumps. For these pumps have mechanical superiority which permits them to retain their efficiency long after less highly engineered pumps begin to waste power.

So use your priority to buy pumps for today with an eye for tomorrow. Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago, Illinois.

FAIRBANKS-MORSE F M **PUMPS** *DIESELS MOTORS SCALES*

Aircraft parts speed to assembly floor on conveyor belts. See page 66

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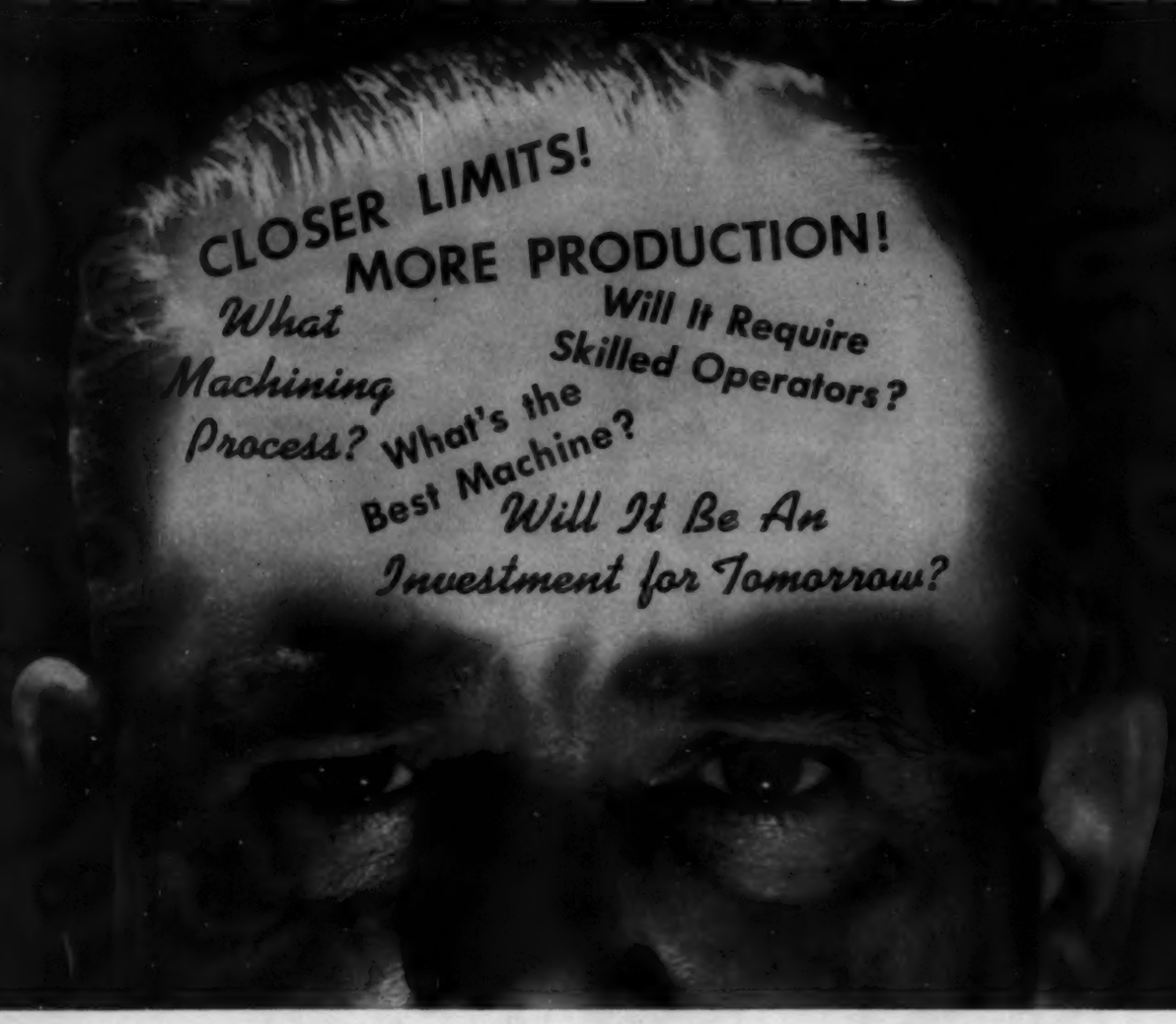
WHAT'S THE ANSWER?



THESE problems . . . more pressing now than ever before . . . find a specific answer wherever production of parts calls for boring, turning, facing, grooving with accuracy and speed. Ex-Cell-O Precision Boring Machines were designed and are made to do exactly this kind of work. With their sturdy, rigid construction, the flexibility in their application, their many automatic features, and simplicity in operation, they produce to "tenth" accuracy . . . and can "take it" round all the hours of the clock . . . *today*, when the greatest pressure that's possible is a national urgency . . . *tomorrow*, when post-war competition will make fast, accurate—and economical—production also a necessity.

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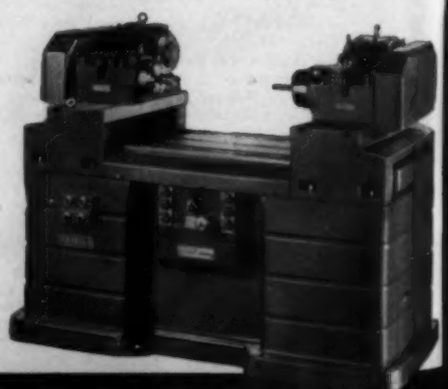
There are nine standard styles of Ex-Cell-O Precision Machines that bore, turn, face, groove with accuracy and speed. They provide an extremely wide range for manufacturers facing production problems today . . . and tomorrow. Below is Ex-Cell-O Style 215-A—Senior Double End Precision Boring Machine.



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EX-CELL-O *means* PRECISION

Precision THREAD GRINDING, BORING AND LAPPING MACHINES, TOOL GRINDERS, HYDRAULIC POWER UNITS, GRINDING SPINDLES, BROACHES, CUTTING TOOLS, DRILL JIG BUSHINGS, PARTS

HIGHLIGHTING

this issue of STEEL

NEWS "The battle of production has been licked," stated Donald M. Nelson last week in announcing the reorganization of the War Production Board. From now on, he declares, the problem is that of building and delivering the types of weapons the generals and admirals want (p. 46).

The Office of Censorship has clamped down further on publication of statistics. Now under ban are figures covering production, consumption and stocks of nonferrous metals (p. 68).

Labor problems incident to 'round-the-clock operations are discussed in a new pamphlet (p. 72). Birth certificates no longer are required to get war jobs. Employe-suggestion plans to be successful must incorporate certain features (p. 73). Classified newspaper advertising now is being used to attract supervisory talent (p. 63).

Rehabilitation of the famous Cramp's shipyard is virtually complete (p. 64). Pilot plants for producing sponge iron will be erected by the Bureau of Mines (p. 60). United States Steel Corp. subsidiaries have organized for air raid defense (p. 69).

Weirton Steel Co. asks a court review of its charges of prejudice, hostility and improper conduct on the part of the National Labor Relations Board (p. 49).

All idle heat treating facilities should be reported to the War Production Board (p. 67). Frozen inventories are to be freed for war production (p. 56). Steel warehouses are to have relief.

PRIORITIES The business of reporting information to the War Production Board is to be simplified (p. 57). A permanent lead pool has been established. Metal shelving will be built only for the armed services (p. 60). Facilities have been provided for consideration of appeals for exceptions to Order M-126 (p. 61). Production of automobile parts is further restricted (p. 64). A new administrative committee has charge of the Production Requirements Plan and the Allocation Classification System (p. 47).

PRODUCTION Steel production now is at the annual rate of slightly more than 85,000,000 tons of ingots (p. 50). Last week's rate was unchanged at 97½ per cent of capacity, due to furnace repairs and shortage of scrap (p. 51). Plate production in June exceeded 1,000,000 tons for the second consecutive month and should be higher in July (p. 133). The shipbuilding program is being helped by more prefabrication (p. 70). American-British war production is being co-ordinated (p. 71).

SUBSTITUTION So critical is the supply of alloying elements that the new NE low-alloy steels are not regarded as a solution to the whole problem of substituting for the old highly-alloyed steels. The alloy requirements of such items as airplane engine crankshafts, battleship and tank armor, guns and many others are so great that many consumers probably will be unable to get even NE steels. Hence it is necessary to investigate the carbon steels which, with proper heat treatment and fabrication, are highly versatile (p. 54). Maximum alloy contents have been established for heat-resistant steels (p. 57).

TECHNICAL In section 13 of the forging series, Professor Macconochie explains how ring forgings are produced without wasting any material by means of the upsetter. The same forging technique (p. 78) is utilized to produce radial aircraft engine cylinders.

The first charts showing *average* properties of certain of the new NE steels are presented (p. 80) along with additional single-heat charts. Thus information is rapidly being accumulated which will permit preparation of curves showing *average* properties of all these low-alloy steels within a few months.

Details of recommended pouring practice and factors involved are analyzed (p. 90) by Paul J. McKimm in another section of his series on the manufacture of high-quality low-cost steel. An interesting innovation is the production of remelting scrap in the slag thimble by filling the bottom with sponge iron and permitting slag from the steel ladle to overflow into the thimble.

By painting machinery castings when they come from the foundry and before they enter the machine shop, one company (p. 100) has been able to speed finishing work, reduce overhead costs, eliminate sand and dust as well as reduce damage to castings.

Case histories show (p. 98) that faster welding actually does result from use of larger welding electrodes. One company reports increase in welding speed from 7 to 16 inches per minute. Another tells how a production job that formerly required 90 minutes of welding now is accomplished in 30 minutes. Such changes are important aids to war production.

Switch to NE Alloy Steels

to Save Critical Metals

TO HELP conserve nickel, chromium, vanadium and other scarce metals, the War Production Board's ablest metallurgists have developed NE (National Emergency) Alloy Steels. These new steels contain relatively small quantities of alloying elements in such combination as to produce physical properties usually attributed to steels of much higher alloy content. The War Production Board stipulates the use of the new NE Alloys to *replace* the standard SAE and AISI Alloy Steels for a wide range of applications.

Ryerson NE Alloy Steel stocks in six specifications, all fine grain, will be available shortly; and will consist of sizes ranging from ½-inch to 7-inch rounds, in three groups:

Carburizing Grades	*Medium Hardening Grades*	*High Hardening Grades*
NE 4023 and NE 8620. To Replace AISI and SAE Nos. A 2300, A 2500, A 3100, A 4100, A 4600, A 5100, A 6100.	NE 4042 and NE 8744. To Replace AISI and SAE Nos. A 2330-35, A 3130-35, A4130-35, A5130-35, A6130-35.	NE 4047 and NE 8749. To Replace AISI and SAE Nos. A 2300, A 3100, A 3200, A 4100, A 4600, A 6100.

Only limited data on heat-treatment response or physical properties will be available when NE Alloys are first ready for shipment. The WPB is anxious to know how these new steels will function and requests all NE Alloy users to report results in working with these new steels. Ryerson will cooperate fully with users, supplying laboratory test data, and all other available information.

• • •

If you now use Alloy steel, let Ryerson help you in adapting NE Alloys to your requirements wherever possible. Write, wire or phone the nearest of the ten Ryerson plants.

JOSEPH T. RYERSON & SON, *Inc.,* Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

RYERSON STEEL-SERVICE

STEEL

July 13, 1942

REGULATION 13 WILL AID DISTRIBUTION OF MATERIALS

Priorities Regulation 13, issued July 7 by WPB to govern the special sales of idle or frozen materials, should result in a better distribution of a considerable portion of the inactive inventory now held by many industrial establishments.

The necessity for Regulation 13 arises from the fact that during the evolution of the priorities system certain restrictions were placed upon the sale of many materials in order that they would not flow into use for unessential civilian goods. During the same period limitation orders were issued calling for cessation of or curtailment in the manufacture of numerous products such as automobiles, refrigerators, typewriters, washing machines and radios.

As a result of these and other WPB regulations, many producers and manufacturers now have on hand quantities of iron, steel and nonferrous materials, parts and products which they cannot use and, until Regulation 13 was issued, could not sell except under rigid restrictions. In short, a sizeable inventory had become virtually frozen — almost banned from use for any purpose.

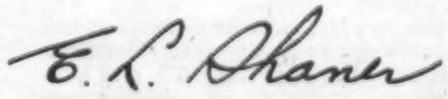
The objective of Regulation 13 is to free this material for use for war production. It is impossible to estimate the volume of all materials thus liberated, but it is believed that the tonnage is considerable. For instance, some authorities place the total of copper and copper base alloys which can be freed by the new regulation at 250,000 tons.

Regulation 13 is an enabling provision rather than a mandatory rule. It provides that the producer or manufacturer holding frozen inventories may dispose of them under the rules of sale specified in the regulation. It does not state that he must sell.

Thus the ultimate effect of the regulation will depend upon the willingness of industrial concerns to avail themselves of the opportunity now presented. It would seem that in most cases, producers and manufacturers would be well advised to sell this idle tonnage to those who are eligible to purchase it under the provisions of Regulation 13.

It is becoming obvious that the intelligent distribution of the materials now on hand is one of the easiest ways of easing the pressure of certain shortages. Industry now can help in equalizing this distribution — in placing inventory where it can be used most effectively.

Editor-in-Chief



Editor-in-Chief

WPB Realigned To Gear Flow of Materials to Military Strategy

◆

Batt and Knowlson appointed vice chairmen. Amory Houghton named Director General of Operations . . . Revamped board will work closely with combined Anglo-American resources committee . . . Smaller War Plants Corp. organized

◆

WASHINGTON

MARKING the end of the "tooling up" phase of the war production program, Donald M. Nelson last week realigned the War Production Board to tie the allocation of critical goods to the demands of high military strategy.

Mr. Nelson said the battle of production itself "has been licked" and that the new problem is to build and deliver the type of weapons which the generals and admirals want.

The big tasks of curtailing civilian production and converting great industries to war manufacture are practically accomplished and the immediate job is to "distribute the materials where they will do the most good." Further conversion of small plants remains to be effected.

Two vice chairmen are provided in the reorganization. One is William L. Batt, former president of SKF Industries Inc., Philadelphia. Mr. Batt will serve as Mr. Nelson's general assistant and deputy, helping him in the determination of policies and in the direction of operations. He will devote his attention to the whole work of the WPB.

Mr. Batt will relinquish the chairmanship of the Requirements Committee but will continue a member of the committee.

The other vice chairman will be James S. Knowlson, who has been Director of Industry Operations. Mr. Knowlson, who formerly was president of Stewart-Warner Corp., Chicago, will have responsibility for program determinations and will serve as Mr. Nelson's deputy on the Combined Production and Resources Board (see page 71). He also will become chairman of the Requirements Committee.

According to Mr. Nelson, the realignment of the WPB is designed to accomplish five objectives:

1—It will clear the decks to make controlling and expediting the flow of materials the board's central effort.

2—It will bring the board into closer touch with military and international production requirements, and increase the board's activities to overall war production strategy.

3—It will strengthen the topside policy, programming and progress-reporting organization of WPB.

4—It will concentrate the operating portions of the board under one head, and place increasing emphasis on the work of industry and commodity branches.

5—It will lighten the administrative load on the chairman so that he can devote his time to essential policy decisions and to the increasingly important relations of WPB with other war agencies.

All operational work of the board —including the industry and materials branches, various bureaus and the field organization—has been placed under a Director General of Operations. This post has been assigned to Amory Houghton, formerly deputy chief of the Bureau of Industry Branches. In private life, Mr. Hougton was president of the Corning Glass Works, Corning, N. Y.

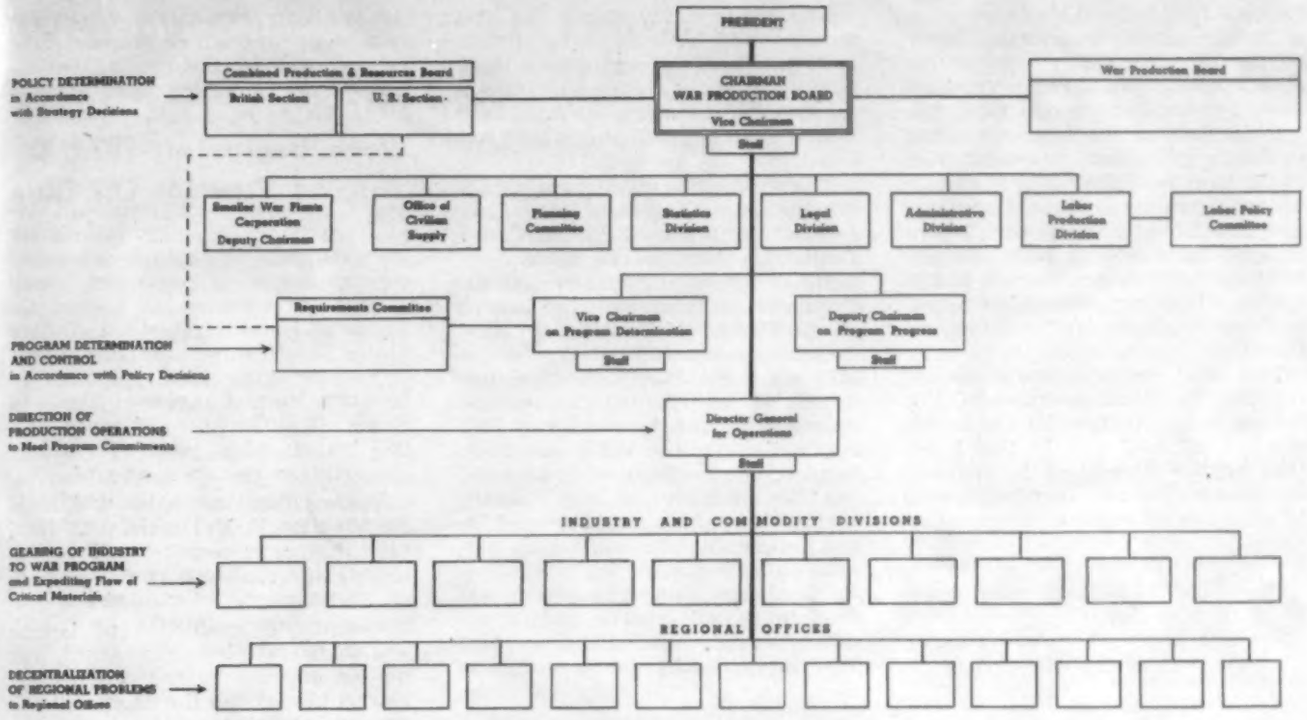
Under the realignment, the programs and policies governing the flow of materials which are worked out by Mr. Knowlson will be put into operation by Mr. Houghton.

A fourth new post—deputy chairman on program progress—also was created but was left unfilled for the present. This official will be a kind of "inspector general" for WPB.

William L. Batt

James S. Knowlson

Amory Houghton



NEW organization of the War Production Board charted. Purpose of shifts announced last week is to obtain closer relationship between the board and "the broad strategic picture", and closer relationship with other government agencies participating in the war effort

Working with the operating units of the board, with the Supply Arms and Services, to which Mr. Nelson has delegated procurement, production and expediting responsibility, and with the board's planning, statistics and other staff divisions, the deputy chairman will follow program progress to anticipate bottlenecks.

Mr. Nelson expressed the belief that the new structure would enable a close and effective tieup between the board and the Combined Production and Resources Board to the end that decisions made by the combined board can be translated speedily into action by the WPB.

The reorganization also will permit a closer relationship with other government agencies connected with the war program, Mr. Nelson said. He pointed that there are several of these agencies to which WPB has delegated responsibility for certain parts of the program, and others whose functions naturally supplement the work of WPB. Closer correlation with all of these is sought by recognizing that all are component parts of the general war organization and by regarding the chief of all the agencies as the "war production general staff", the WPB chairman stated. He said there will be close contacts with the members of this general staff to discuss overall problems, especially those relating to the discharge of delegated functions.

A Smaller War Plants Corp., in line with legislation recently approved by Congress, also has been formed. The corporation, whose head will also serve as deputy chairman of WPB on smaller war plants, will report directly to Mr. Nelson's office. Its directors will be announced soon.

Leon Henderson continues as director of the Office of Civilian Supply, and will serve as chief adviser to Mr. Nelson on the changing needs of the civilian economy.

Working with Mr. Knowlson on program determination will be the Procurement Policy Division, formerly the Division of Purchases, under Houlder Hudgins, and a new Construction Program Division, which will be responsible for considering and programming all plans for capital expansion, military or otherwise.

Labor Production Division continues under Wendell Lund, and reports directly to the WPB chairman. Its Labor Advisory Committee becomes the Labor Policy Committee, whose duty it will be to study the problems of labor in production and advise Mr. Nelson on them.

Working with the Director General of Operations will be the following units, other than the industry and commodity branches:

The Conservation Division.

A new Production Engineering Division, which will help in the development and wide use of new production methods and techniques in the war program.

A new Facilities Utilization Division, which will be responsible for seeing to it that use is made of available productive facilities.

The Inventory Control Division.

The Division of Industry Advisory Committees.

The Priorities Administration Division.

Reporting directly to Mr. Nelson, as units whose services are used by all parts of the WPB, will be the Legal Division, the Office of Organizational Planning, the Office of Information, the Planning Committee, the Statistics Division and the Administrative Division.

Committee To Administer Allocation Classification System and PRP

COMMITTEE to administer the Production Requirements Plan and the Allocation Classification System was established last week by WPB Chairman Donald M. Nelson. It will function under the WPB Bureau of Priorities and includes representatives of the Army and Navy Munitions Board.

The PRP since it became manda-

tory on July 1 for most large users of metal, is now the principal method used by the WPB to direct the flow of materials into war and essential nonmilitary production.

Chairman of the new committee is Henry P. Nelson, assistant chief of the Bureau of Priorities in charge of requirements. Other members are from the Division of Civilian Supply, Materials Division, Bureau of Industry Branches, Bureau of Priorities, Requirements Committee, and Army and Navy Munitions Board.

The new committee will review the PRP application form PD-25A for use in applications for the fourth quarter of 1942. It is the intention of the committee to simplify the form as much as possible and to eliminate all required information except what is absolutely necessary for proper assignment of preference ratings and authorization of quantities of material which companies operating under PRP may receive. The new forms are expected to be ready within three weeks, so that industry will have ample opportunity to fill them out and return them in time to allow a complete statistical study of requirements before the fourth quarter applications are processed.

The Production Requirements Operating Committee will also have full charge of the Allocation Classification System, whose administration has now been transferred to the Production Requirements Branch of the Bureau of Priorities.

Other responsibilities of the committee include establishment of time schedules for all PRP operations; determination of the routing of PRP applications within WPB; establishment of the methods of implementing the decisions of the Requirements Committee with respect to the acquisition of materials for production by industry.

In order to assure consistency and uniformity, all reports, orders and other communications concerning PRP prepared by the branches of the WPB for circulation outside an individual operating branch must be approved by the Production Requirements Operating Committee.

"Rubber from Grain"— Nelson Before the Senators

Proposed legislation to create a separate rubber supply agency which would have charge of producing synthetic rubber from farm and forest products and which would be empowered to allocate materials needed for plant construction was opposed by WPB Chairman Donald M. Nelson before the Senate agricultural subcommittee last week. Mr. Nelson was especially critical of the provision for allocation of materials.

He told the committee, however, that if he were to start the synthetic rubber program "all over again, I would build a much larger percentage " of plants using grain alcohol. Present plans call for 25 per cent of the plants to use alcohol, while the remainder will use the petroleum process. Photo shows Senator George W. Norris, Nebraska, left foreground, looking intently at Mr. Nelson, right. In the background, left to right, are Senator Elmer Thomas, Oklahoma; Senator Guy M. Gillette, Iowa; and Paul E. Hadlick, committee counsel. NEA photo.

Work Begins on 127,500 Tons of Pipe for Oil Line

PITTSBURGH

Production of 24-inch diameter pipe at a rate of five miles a day started last week at the Lorain, O., works of National Tube Co., United States Steel Corp. subsidiary. This is for the 550-mile oil pipeline to be laid from Longview, Tex., to Salem, Ill. The line will carry 300,000 barrels of oil daily for transshipment to eastern seaboard.

Stating that the order will total 127,500 tons, B. F. Harris, president, said that four months will be required to complete it at a daily rate of 1200 tons, or 40 carloads.

Company's production of bombs and shells, now being increased, will not be affected by the order. Mr. Harris also stated the company will supply bomb tubing to a large percentage of firms entering that field and that use of its spinning process is being made available without charge to a number of companies.

Inland Agrees To Scrap-Price Injunction Order

CHICAGO

Federal Judge William H. Holly on July 7 granted OPA an injunction restraining Inland Steel Co. from violating price ceilings on iron and steel scrap. The company agreed to the entry of the order.

Petition for the injunction was filed June 23 by Alex Elson, regional attorney for OPA. At the hearing, Mr. Elson alleged the company had violated iron and steel scrap schedule No. 4 by paying excess prices for upgraded material. It did so, he declared, notwithstanding the fact that its records showed the scrap to be of lower quality than should have been received for prices paid.

John C. Weigel, regional administrator for OPA, submitted a statement to the court which said the company's practices had "seriously dislocated collection and distribution" of scrap metal in the Middle West. Company denied any intent to violate regulations, and declared its efforts are concentrated on getting out steel for war purposes. (STEEL, June 29, p. 47.)

Evans Ward, president, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., has been appointed chairman of the bolt and nut division of the War Production Fund To Conserve Manpower, established in response to a Presidential proclamation asking for accident prevention in war industries.

Weirton Charges NLRB Officials Held Secret Conferences with SWOC

UNITED STATES Circuit Court of Appeals, Pittsburgh, was petitioned by Weirton Steel Co. last week for a hearing on its charges that the company was wilfully denied an impartial hearing before the National Labor Relations Board and that actions taken by the board in its case were contrary to law by reason of the board's prejudice, hostility and improper conduct.

The petition also requested a stay of proceedings on the petition for enforcement of the board's order in the case which the board recently filed with the same court.

In the Weirton petition, improper conduct is ascribed not only to the trial examiner and other agents of the board who participated in the Weirton hearing but also the board members who, at the time of the hearing, were J. Warren Madden, chairman; Donald Wakefield Smith and Edwin S. Smith.

Lasted More Than 17 Months

The Weirton hearing was one of the longest labor board cases on record. It began in New Cumberland, W. Va., Aug. 16, 1937, and continued, with a number of interruptions, until Jan. 31, 1939. The board handed down its final order July 25, 1941. The main provisions ordered Weirton to reinstate 17 of the more than 300 claimants and pay them back wages, to disestablish two independent labor organizations, and to cease and desist from alleged unfair labor practices. The company notified the labor board that it had complied with the order, with the exception of payment of back wages and re-employment of two of the 17 claimants. Late last May, the board petitioned Circuit Court to enforce the order in its entirety.

The Weirton petition now avers that the board did not act in good faith, but exercised its powers in a biased and arbitrary manner, fully intending, before hearing the evidence, to decide the case against the company. Further, that the board issued the complaint and board agents conducted the hearing as part of a general plan to aid the SWOC in its campaign to organize employes of Weirton and other steel companies.

A substantial portion of the petition is devoted to the conduct of the trial examiner, Edward Grandison Smith. Specific charges against him are:

That in secret conference with board attorneys he conspired to exclude Clyde A. Armstrong, Weirton's principal counsel, from the hearing and thereafter made an order excluding Armstrong from the case.

That he held secret conferences with board attorneys at which were discussed evidence being produced or to be produced and rulings which were to be made on matters pending before him. On such occasions, board attorneys influenced the trial examiner in the making of rulings and, in turn, the trial examiner advised board attorneys as to the type of evidence which should be produced.

That the trial examiner held secret conferences with Kenneth Koch, a SWOC organizer, at which he discussed evidence with Koch and advised him as to the kinds of facts and circumstances which might be produced as evidence against the company.

That the examiner agreed to arrange a meeting between Madden and Koch so that the latter might have an opportunity to influence Madden to make a decision favorable to SWOC. That Madden then secretly conferred with Koch, and at the meeting said he wished to have further discussion with Lee Pressman, chief counsel for SWOC, and requested Koch to arrange a conference for that purpose.

That the examiner hampered the company by shielding board witnesses and placing improper limits on the cross-examination of witnesses by company attorneys while allowing unlimited privileges to board attorneys; by allowing board attorneys to introduce improper evidence that could not be investigated or contradicted; by permitting board attorneys and SWOC representatives to issue subpoenas while refusing subpoenas to the company; by threatening and segregating witnesses whose testimony was favorable to the company; by allowing board attorneys to threaten witnesses for the company, and by allowing board attorneys to delay and interrupt the cross-examination of witnesses for the company so that they might have an opportunity to approach and, in some cases, intimidate the witnesses.

Obviously, Copy-Book Stuff, Says the President

Opposition to a general rise in steel wages was indicated by President Roosevelt last week. The Chief Executive was asked at his press conference whether a general wage increase would conflict with his anti-inflation program. He replied that such an increase would be a factor in raising the cost of living. That is obvious, he added, terming it copy-book stuff.

Asked if he intended to make an announcement of federal wage policy soon, the President said he did not know.

Meanwhile the case of the "Little Steel"-United Steelworkers of America case, in which a union demand for a $1 a day increase is a leading issue, was pending before the full War Labor Board, created by Presidential order.

WPB Reports 72 Per Cent of War Workers Union Members

Seventy-two per cent, "an overwhelming majority," of the two million men in plants with labor-management committees are members of unions, WPB announced last week after making a survey of nearly 1000 plants co-operating in the "War Production Drive."

"Of the remaining 28 per cent, many may have union affiliations which have not been mentioned in reports to War Production Drive Headquarters or to the Bureau of Labor Statistics," the board said.

Affiliation	No. of Plants	No. of Workers
CIO	310	789,886
AFL	132	247,952
Independent	67	216,692
Varied Affiliations	43	220,154
Unknown	370	576,914
Totals	922	2,051,598

Ask Bombardment of WLB On Steel Wage Increase

Cleveland CIO unions last week were urged by William F. Donovan, president of the Cleveland Industrial Union Council, to bombard the President, the War Labor Board and WPB Chairman Donald M. Nelson with telegrams, letters and postcards supporting the United Steelworkers of America demand for a $1 a day wage increase, now being studied by the WLB.

Only Pay Increase Will Cure War Workers' "Illness"

War production at five Rochester, N. Y., plants was slowed down last week by refusal of 30 hoisting engineers to report for work because of "illness" which their business agent said could be speedily cured by a wage increase. The "epidemic" affected work at the Hawkeye plant addition, Rochester Gas & Electric Corp., Symington Gould Co., Consolidated Machine Tool Co. and a Metals Reserve Co. building.

(For additional labor news see pages 72-73.)

First-Half Ingot Output 4 Per Cent Over Prior Record

STEEL ingot and casting production in the first six months of 1942 established a new peak of 42,570,247 net tons, more than 4 per cent greater than 40,868,204 tons in the corresponding period in the record-breaking year, 1941, according to the American Iron and Steel Institute. In an estimate of first-half production in Steel, June 29, page 49, the total was placed at more than 42,500,000 tons.

Open hearth production in the half-year was 37,889,027 tons, 2 per cent above first half last year and bessemer output was 2,798,856 tons, 8 per cent over the corresponding portion of 1941. Electric steel produced in first half totaled 1,882,364 tons, nearly 50 per cent more than in first half last year.

June production was 7,022,155 tons, equivalent to 96.4 per cent of capacity, compared with 7,386,890 tons, 98.2 per cent, in May. In June, 1941, production was 6,792,751 tons, equivalent to 98.1 per cent of capacity then existing.

Average weekly production in June was 1,636,886 tons, compared with 1,667,470 tons per week in May and 1,583,392 tons weekly in June, 1941.

Plate Production at New Peak: 75 Per Cent for War

Increasingly effective job in producing plates for war materials won for the steel industry the praise of A. I. Henderson, WPB Director of Materials, last week. Mr. Henderson announced June plate production established a new record at 1,050,962 net tons, compared with 1,012,194 tons in May.

Greatest factor in the increase, Mr. Henderson pointed out, has been the extremely difficult problem of converting continuous strip mills to plate production.

Problems involved in rolling and handling plates one inch thick as compared to sheets one twenty-fifth of an inch thick are obvious. Heavier equipment is needed all along the line. Less obvious but actually more complex has been the problem of additional space to house this heavier equipment and to handle heavy plate. Partitions have been ripped out, walls moved and every sort of expedient used to make way for the plates that make ships, guns and tanks.

How successful this effort has been is evidenced by June output of 489,704 tons of plates from strip mills that were producing none a few months ago. May production was 425,211 tons.

This is the first time since the program opened that plate production from strip mills has exceeded that from sheared mills. These latter, regular source of plates, turned out 438,000 tons in June.

Approximately 75 per cent of the record June output went to fill Army, Navy and Maritime Commission requirements.

Bethlehem at 99.2 Per Cent In June, All for War Work

Bethlehem Steel Co. in June operated at 99.2 per cent of capacity and produced 1,005,000 tons of steel in the 30 days, according to Eugene G. Grace, president. This was accomplished despite the fact the plant at Bethlehem, Pa., was still suffering from effects of floods in May.

A record of 43,000 tons of pig iron was made by one blast furnace. Shipments included 167,000 tons of structural material and 155,617 tons of plates. Of the latter, a converted strip mill formerly devoted to automobile body sheets produced 56,000 tons of plates.

Bethlehem production is devoted entirely to war effort, over 83 per cent being assigned by Washington to specific products and the remainder being produced on priorities, none lower than A-1-a, for direct or indirect war work.

Gary Plate Mill Celebrates Fourth by New Output Record

Three crews on the 160-inch plate mill of Carnegie-Illinois Steel Corp. at Gary Works, Gary, Ind., working through Independence Day, "broke all records for a mill of this type". The day's production represented an operating rate of 252 per cent of theoretical capacity. The first shift exceeded best prior performance by 140 tons, the second by 120 tons and the third by 104 tons. The 24-hour total was almost 700 tons greater than the previous high, established June 25. The three crews set a record for the week of almost 9400 tons,

STEEL INGOT STATISTICS

	Estimated Production—All Companies								Calculated weekly production, all companies Net tons	Number of weeks in month
	—Open Hearth—		—Bessemer—		—Electric—		—Total—			
	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity		
Based on Reports by Companies which in 1940 made 98.43% of the Open Hearth, 100% of the Bessemer and 85.82% of the Electric Ingot and Steel for Castings Production										
1942										
Jan. . .	6,328,128	95.4	490,864	86.0	305,930	96.3	7,124,922	94.7	1,608,335	4.43
Feb. . .	5,791,813	96.7	453,543	88.0	275,700	96.2	6,521,056	96.0	1,630,264	4.00
Mar. . .	6,574,701	99.1	493,294	86.4	324,916	102.3	7,392,911	98.2	1,668,829	4.43
1st quar	18,694,642	97.0	1,437,701	86.7	906,546	98.3	21,038,889	96.3	1,635,994	12.86
April .	6,346,707	98.8	454,583	82.2	321,023	104.4	7,122,313	97.7	1,660,213	4.29
May . .	6,600,376	96.5	454,054	79.5	332,460	104.7	7,386,890	98.2	1,667,470	4.43
June .	6,247,302	97.2	452,518	81.6	322,335	104.8	7,022,155	96.4	1,636,866	4.29
2nd qtr	19,194,385	98.5	1,361,155	81.2	975,818	104.6	21,531,358	97.4	1,654,985	13.01
1st half	37,889,027	97.8	2,798,856	83.9	1,882,364	101.5	42,570,247	96.9	1,645,545	25.87
Based on Reports by Companies which in 1940 made 98.43% of the Open Hearth, 100% of the Bessemer and 85.81% of the Electric Ingot and Steel for Castings Production										
1941										
Jan. . .	6,274,780	99.0	451,806	76.0	195,766	89.1	6,922,352	96.8	1,562,608	4.43
Feb. . .	5,669,425	99.1	378,536	70.5	182,393	91.9	6,230,354	96.5	1,557,589	4.00
Mar. . .	6,457,641	101.9	460,225	77.4	206,137	93.8	7,124,003	99.6	1,608,127	4.43
1st quar	18,401,846	100.1	1,290,567	74.8	584,296	91.6	20,276,709	97.7	1,576,727	12.86
April . .	6,137,613	100.0	395,096	68.6	221,510	104.1	6,754,179	97.6	1,574,401	4.29
May . .	6,362,245	100.4	444,079	74.7	238,241	108.4	7,044,565	98.5	1,590,195	4.43
June .	6,098,171	99.4	458,848	79.7	235,732	110.8	6,792,751	98.1	1,583,392	4.29
2nd qtr	18,598,029	100.0	1,297,983	74.3	695,483	107.8	20,591,495	98.1	1,582,744	13.01
1st half	36,999,875	100.0	2,588,550	74.6	1,279,779	99.7	40,868,204	97.9	1,579,753	25.87
July . .	6,085,100	94.4	489,297	85.0	237,827	85.7	6,812,224	93.3	1,541,227	4.42
Aug. . .	6,244,353	96.6	495,761	85.9	257,382	92.6	6,997,496	95.6	1,579,570	4.43
Sept. . .	6,054,418	96.9	500,768	89.8	256,568	95.5	6,811,754	96.3	1,591,531	4.28
3rd qtr	18,383,871	96.0	1,485,826	86.9	751,777	91.2	20,621,474	95.1	1,570,562	13.13
9 mos.	55,383,746	98.6	4,074,376	78.6	2,031,556	96.4	61,489,678	96.9	1,576,658	39.00
Oct. . .	6,423,329	99.4	533,060	92.4	279,679	100.6	7,236,068	98.9	1,633,424	4.43
Nov. . .	6,194,679	99.0	488,822	87.5	277,384	103.0	6,960,885	98.2	1,622,584	4.29
Dec. . .	6,387,865	99.0	481,813	83.7	280,637	101.2	7,150,315	97.9	1,617,718	4.42
4th qtr	19,005,873	99.1	1,503,695	87.8	837,700	101.6	21,347,268	98.3	1,624,602	13.14
Total .	74,389,619	98.8	5,578,071	80.9	2,869,256	97.9	82,836,946	97.3	1,588,741	52.14

The percentages of capacity operated in the first six months of 1941 are calculated on weekly capacities of 1,430,102 net tons open hearth, 134,187 net tons bessemer and 49,603 net tons electric ingots and steel for castings, total 1,613,892 net tons; based on annual capacities as of Dec. 31, 1940 as follows: Open hearth 74,565,510 net tons, bessemer 6,996,520 net tons, electric 2,586,320 net tons. Beginning July 1, 1941, the percentages of capacity operated are calculated on weekly capacities of 1,459,132 net tons open hearth, 130,292 net tons bessemer and 62,761 net tons electric ingots and steel for castings, total 1,652,185 net tons; based on annual capacities as of June 30, 1941 as follows: Open hearth, 76,079,130 net tons, bessemer 6,793,400 net tons, electric 3,272,370 net tons.

The percentages of capacity operated in 1942 are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942 as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

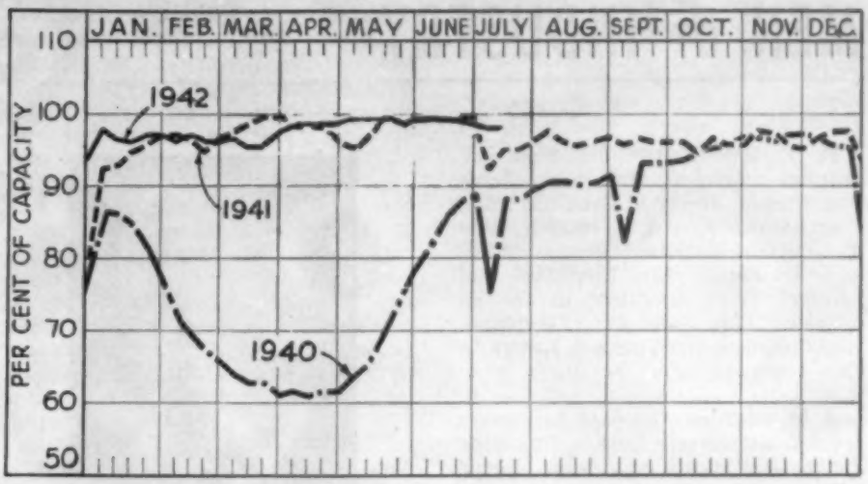
	Week ended July 11	Change	Same week 1941	Same week 1940
Pittsburgh	95	+ 1	99.5	80
Chicago	101.5	— 1.5	100.5	95
Eastern Pa. ...	96	None	97	84
Youngstown ..	95	None	98	84
Wheeling	77.5	— 6	91	94
Cleveland	95	+ 3	96.5	77
Buffalo	90.5	None	93	90.5
Birmingham ..	95	None	90	88
New England..	92	— 3	90	85
Cincinnati	92	+ 1	88	77.5
St. Louis	95.5	None	98	65
Detroit	89	— 2	96	92
Average	97.5	None	*95	*88

*Computed on basis of steelmaking capacity as of those dates.

an increase of almost 500 tons over the best previous output.

Armco Makes Fourth Monthly Pig Iron Increase in June

For the fourth consecutive month, Hamilton, O., plant of American Rolling Mill Co. set a new high record for pig iron production, June tonnage being 314 tons greater than in May. In each of the four months production has been above rated capacity.



PRODUCTION . . . . Steady

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week was unchanged at 97½ per cent. Three districts advanced, four declined and five were steady. A year ago the rate was 95 per cent; two years ago it was 88 per cent, both based on capacity as of those dates.

Youngstown, O. — Though under serious handicap from limited scrap supply steelmaking continued at 95 per cent last week, with 75 open hearths and three bessemers active. Outlook for this week is for the same schedule.

Chicago — Down 1½ points to 101½ per cent, the lowest rate in 25 weeks or since Jan. 17. Furnace repairs were mainly responsible. One mill had two open hearths idle for lack of scrap. Carnegie-Illinois Steel Corp. has blown out a blast furnace at Gary works for relining. It will be down about three weeks.

Cincinnati—Gained 1 point to 92 per cent. All open hearths are operating except two off for repairs.

St. Louis—In the face of diminishing scrap supply production was maintained at 95½ per cent. One producer is using reserves.

Pittsburgh—Gained 1 point to 95 per cent.

Wheeling—Declined 6 points to 77½ per cent.

Buffalo—Unchanged at 90½ per cent despite a brief interruption by a walkout.

Detroit—With three open hearths down for repairs the rate is 2 points lower at 89 per cent.

Central eastern seaboard — Unchanged at 96 per cent, with one interest dipping into stock to maintain his production.

Cleveland—One interest operated at 100 per cent and another added an open hearth at midweek, causing the rate to rise 3 points to 95 per cent.

Birmingham, Ala.—Steady at 95 per cent, with 23 open hearths in production.

New England—Furnace repairs reduced steel production 3 points to 92 per cent last week.

Sailors at Midnight Cheer Gary Workers' Record

WHEN steelworkers on each of the three shifts of the 160-inch plate mill at Carnegie-Illinois Steel Corp.'s Gary works smashed all production records on July 4, a group of Navy officers and enlisted men, headed by Lt. Comdr. William T. Kellogg and Lt. T. M. Brautigan, visited the plant at midnight, July 4, to congratulate two of the three crews. One of the enlisted men, Seaman William Nason, former employe and union shop steward at the plant, is seen expressing the Navy's praise

Specially designed wooden beds will supplant present steel folding cots in all purchases by the Army Quartermaster Corps.

MEN of INDUSTRY

H. E. ROBINSON has been appointed manager, strip sheet sales department, Jones & Laughlin Steel Corp., succeeding **A. J. Hazlett,** who has become assistant general manager of sales. Mr. Robinson was formerly vice president in charge of sales, Otis Steel Co., Cleveland, which is now the Jones & Laughlin Otis works.

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J. M. Gilfillan, the past two years works manager, Locke Insulator Corp., Baltimore, has been elected vice president in charge of manufacturing.

♦

Frank J. Hill, heretofore sales manager, has been elected vice president, Greene, Tweed & Co., New York. He has been associated with the company since 1915.

♦

C. B. Archibald, formerly St. Louis district manager, Edison Storage Battery Division of Thomas A. Edison Inc., West Orange, N. J., has been appointed manager of the Pittsburgh office, while **John J. Hughes,** former salesman in the St. Louis district, has been appointed manager there.

♦

Arthur M. Houser, engineer of standardization, Crane Co., Chicago, has been appointed consultant in the Simplification Branch, Bureau of Industrial Conservation, War Production Board, Washington.

♦

Charles Schneider, promotion editor of the *Cleveland Press* and director of its Public Service Bureau the past six years, has been appointed advertising director, Arco Co., Cleveland.

♦

Thomas J. Knapp, former traffic manager and assistant sales manager, Freeport Sulphur Co., New York, has been elected assistant vice president. Mr. Knapp was also made assistant vice president of the Freeport subsidiaries, Cuban-American Manganese Corp. and Nicaro Nickel Co., and will supervise shipment of materials and supplies to Cuba for the $20,000,000 nickel plant and facilities which Nicaro is building and will operate for the United States government.

♦

F. W. McIntyre has returned to his duties as vice president and general manager, Reed-Prentice Corp., Worcester, Mass., after spending 15 months with the Tools Section, War Production Board, Washington.

♦

H. L. Bills, director of industrial relations, Acme Steel Co., Chicago,

H. E. Robinson

C. B. Archibald

was recently elected vice president, Industrial Relations Association of Chicago. Mr. Bills has been active in this field the past 20 years having been associated with a firm of industrial management engineers 16 years before his Acme appointment in 1937.

♦

T. Ellwood Webster, formerly associated with Edward G. Budd Mfg. Co., Philadelphia, has been appointed general manager, in full charge of operations at the New Castle defense plant, New Castle, Del., Ordnance Division of Edge Moor Iron Works Inc., Edge Moor, Del.

♦

L. W. Brashares has been appointed manager, Cincinnati district, American Rolling Mill Co., Middletown, O., and **E. D. Dronberger** has been named manager at Dayton, O. **C. G. Farabee** has been made manager of the Chattanooga, Tenn., district. **G. C. Wilson,** Middletown district manager, has taken an indefinite leave of absence because of ill health.

♦

David Logan and **Frank W. Pedrotty** have been appointed district sales representatives, American Foundry Equipment Co., Mishawaka, Ind. Mr. Logan, associated with the company since 1908, will maintain headquarters at 242 Broad street apartments, Newark, N. J., while Mr. Pedrotty's headquarters are at 911 Wynnewood road, Philadelphia. He joined the company in 1926.

♦

Neil C. Reed, heretofore manager of the Buffalo office of Westinghouse Electric Elevator Co., has been appointed assistant manager of the $14,000,000 Navy propulsion equipment plant which Westinghouse Electric & Mfg. Co. is building in western Pennsylvania.

♦

Rowland J. Black, formerly chief inspector, Buffalo Arms Corp., Cheektowaga, N. Y., has been named assistant factory manager. **Don E. Miller,** assistant chief inspector, succeeds Mr. Black as chief inspector, while **Joseph F. Walldorf,** who has been in the inspection department, has been made assistant general superintendent.

♦

R. Keeler, heretofore in the engineering and sales department of Cutler-Hammer Inc., Milwaukee, has been transferred to the Philadelphia office. **J. E. McSorley,** associated with the resales division, has been transferred to the Cincinnati district office, and **J. A. Darnall** is now identified with the New York district office. He formerly was in the sales department at Milwaukee.

♦

Robert H. Pyle has been appointed district representative for McKenna Metals Co., Latrobe, Pa., in southern Indiana. His headquarters are at 3801 College avenue, Indianapolis.

♦

Jerome Taylor, attorney, has joined B. F. Goodrich Co., Akron, O., as assistant counsel. He has been engaged in the practice of law since graduation from Columbia University Law School in 1931.

♦

Ralph I. Schuppener, identified with the steel container industry many years and for ten years sales manager, Steel Barrel and Pail Division, Wheeling Corrugating Co., has joined Bennett Mfg. Co., Chicago, as eastern sales manager, with headquarters at Washington hotel, Washington, D. C. He will be in charge of all sales east of Pitts-

burgh and will also be in charge of sales in connection with government business.

♦

Robinson D. Bullard, reclamation engineer, Bullard Co., Bridgeport, Conn., has been named technical consultant, Industrial Salvage Section, Bureau of Industrial Conservation, War Production Board, Washington. He will assist in preparing a definitive book on industrial reclamation.

♦

Gustave Koch, the past four years head of the science department, Tonawanda high school, Tonawanda, N. Y., has been appointed director of training, Bell Aircraft Corp., Buffalo. He has been granted a leave of absence from the Tonawanda school system to undertake this war work.

♦

James M. Hoghland has been named sales engineer in the Pacific coast area for American Screw Co., Providence, R. I. He will supplement the efforts of **K. T. Jackson,** who, up until now, has been covering the entire territory for American. For the present Mr. Hoghland will be located at 1724 North Vista street, Hollywood, Calif.

♦

George H. Bridges, manager of the Chicago office, Raleigh Smokeless Fuel Co., has been appointed temporary treasurer, Chicago Wholesale Coal Shippers Association, succeeding **Edward Denmark,** Illinois Western Coal Co., Chicago, resigned. Mr. Bridges will be formally elected treasurer at the next regular meeting of the organization.

♦

David H. McMaster, vice president, Bell & Zoller Coal Co., Chicago, has been elected president, succeeding the late G. D. Cowin. **Homer F. McDonald** succeeds Mr. McMaster as vice president. **William P. Young** has been named president, Bell & Zoller Coal & Mining Co., of which Mr. Cowin also had been president.

♦

Carl Howe, vice president in charge of traffic, Erie railroad Co., Cleveland, has been appointed resident vice president in charge of all departments at Chicago. Mr. Howe is succeeded at Cleveland by **Harry W. Von Willer,** heretofore assistant vice president. **David R. Thompson,** freight traffic manager in Chicago, succeeds Mr. Von Willer as assistant vice president and has been transferred to Cleveland.

♦

James J. Grogan, general freight traffic manager, Atchison, Topeka, Santa Fe & Pacific railroad, Chicago, has been appointed to the newly created post of assistant traffic vice president. **Tracy L. Bothwell,** freight traffic manager, succeeds Mr. Grogan as general freight traffic manager. Mr. Bothwell, in turn, is succeeded by **James P. Hackler,** assistant general freight agent of the Panhandle and Santa Fe railway.

♦

R. L. Tindall has been appointed purchasing agent, Chesapeake & Ohio Railway Co., New York, Chicago & St. Louis Railroad Co., and Pere Marquette Railway Co., Cleveland. **S. R. Secor** has been named assistant to general purchasing agent, and **W. R. Bowers** and **J. R. Clary** have been made assistant purchasing agents.

♦

Harry L. Wise has been elected vice president and general manager, Hydraulic Machinery Inc., Detroit. The past seven years Mr. Wise has been sales engineer in the Detroit territory for Vickers Inc.

♦

R. J. Bahr has been named purchasing agent, General Electric Radio, Television and Electronics Department, General Electric Co., Schenectady, N. Y. He formerly was buyer for the receiver division of the department at Bridgeport, Conn.

♦

William Iekel, special equipment designer, Kearney & Trecker Corp., Milwaukee, has been elected chairman, Milwaukee Chapter No. 4, American Society of Tool Engineers. Other officers are: Secretary, **Paul O. Wernicke,** chief engineer, Stokerunit Corp.; treasurer, **Roland N. Navertz,** tool engineer, Cutler-Hammer Inc.

♦

Philip O. Geier, chairman of the board and treasurer, Cincinnati Milling Machine Co., Cincinnati, was recently elected honorary life member, Cincinnati Chamber of Commerce, which organization he headed in 1925, and served as a director from 1924 to 1936.

♦

E. F. Johnson has been elected a vice president, General Motors Corp., and has been named group executive in charge of the recently organized Eastern Aircraft Division, Linden, N. J., and of the six divisions of the corporation in Dayton, O. The past two years Mr. Johnson served in Washington with war production agencies. He formerly had been assistant to vice president in charge of parts and accessory divisions of General Motors.

♦

Seward A. Covert has been appointed assistant to the president, Ohio Crankshaft Co., Cleveland, in charge of public relations and industrial publicity. Mr. Covert has served Ohio Crankshaft as public relations counselor for more than a year while associated with Graves Taylor & Associates, Cleveland.

DIED:

George B. McConnell, 46, manager of operations, Scully Steel Products Co., Chicago, July 3. Associated with Scully since 1923, he became manager of the engineering department in 1927 and was promoted to manager of operations last March.

♦

Walter L. Heughes, 56, president, F. L. Heughes & Co. Inc., Rochester, N. Y., June 25. Identified with the structural steel business more than 30 years, ten years ago he became head of the steel firm founded by his father, the late Frederick L. Heughes.

♦

Louis C. Edgar, 58, assistant chief engineer, Carnegie-Illinois Steel Corp., Pittsburgh, June 30. He was chief engineer for Edgar Thomson works 22 years before transferring to Pittsburgh.

♦

Robert F. Runge, 56, vice president, SKF Industries Inc., July 6, in Philadelphia. Mr. Runge, after graduation in 1906 from Drexel Institute, went to work in the engineering department of Hess-Bright Mfg. Co., which later became SKF. He became vice president in 1920.

♦

George E. Eesley, Buffalo warehouse manager, Service Steel Co., Buffalo, June 4, in that city.

♦

Edmund H. Jung, 67, for 50 years a salesman for Cleveland Twist Drill Co., Cleveland, at his home in West Nyack, N. Y., July 1.

♦

William Morris Hager, 74, who retired in 1940 as vice president, American Car & Foundry Co., New York, July 1, in Montclair, N. J.

♦

Robert James Magor, 60, president, National Steel Car Corp., Montreal, Que., and a leading Canadian financier, in Montreal, July 4.

♦

William J. Peters, 72, retired treasurer, Pullman Standard Car Mfg. Co., Chicago, June 29, in that city. He retired in 1940 after 30 years' service.

♦

Prof. Emeritus Charles Edwin Rogers, 68, head of the department of civil engineering, Trinity College, Hartford, Conn., for 35 years, June 30, in that city. He retired in 1940.

♦

W. Graham Boyce, 57, chairman of the board, Porcelain Enamel & Mfg. Co., Baltimore, in Lewes, Del., July 4. He was a director, Davison Chemical Corp., which he helped reorganize several years ago.

Critical Alloy Shortage To Force Wider Utilization of Carbon Steels

THE ENTIRE subject of steel utilization is due for an early going-over, in the opinion of informed observers, if essential war manufacturing requirements are to continue to be supplied adequately. The problem grows out of the extremely critical supply of such alloying elements as nickel, molybdenum and vanadium.

Opinion now is crystallizing that the new NE steels alone will not prove to be the solution to the whole problem of substituting low-alloy steels for the old high-alloy steels. It now is believed by students of the industry that there will have to be wholesale substitution of carbon steels for alloy and low-alloy steels; there is not enough of the scarcer alloying elements to make possible any large and general supply of low-alloy steels.

Steelmakers are beginning to talk about the need for a change in the existing priorities system. As this system now operates a holder of an order with sufficiently high priority rating can get an alloy steel irrespective of the use to which it is put. They declare that the point now has been reached where all items of ordnance should be listed in the order of their importance and that alloy steels should be apportioned among them in accordance with the quantities of alloying elements available.

Such a list would have to be drawn up after a study of the relative importance of alloy steel for such items as battleship and tank armor, guns, projectiles, aircraft engine crankshafts, transmissions and many more. It safely can be assumed that alloy steels are more necessary in some of these applications than in some others so the question to be decided is which and how much alloy should go into this and that. Appraisal of this type, of course, could be made only by properly qualified officers in the armed forces.

The outcome of such a study should be that certain companies now using alloy steels would no longer be able to get alloy steels, says one metallurgist. He feels, therefore, that consumers in general should not be encouraged to seek substitutes for the old alloy steels among the new NE steels. Instead, consumers should be encouraged to investigate the possibilities of carbon steels, which, if properly heat-treated and fabricated, are highly versatile.

"Certain metallurgists long have held that 1040 carbon steel will, if properly heat treated, serve in all applications in place of the more highly alloyed steels of similar carbon range, such as 3140 and 4140," he said.

"In making steel we will have to make the best use of the materials we have. That means that in alloy steels we are headed for chromium-silicon-manganese alloys. There just is not enough nickel, molybdenum and vanadium to permit even a modification of the old metallurgy on any substantial scale. That condition will not be liked by a great many people but it has to be faced realistically. In the meantime, carbon steel should be used wherever

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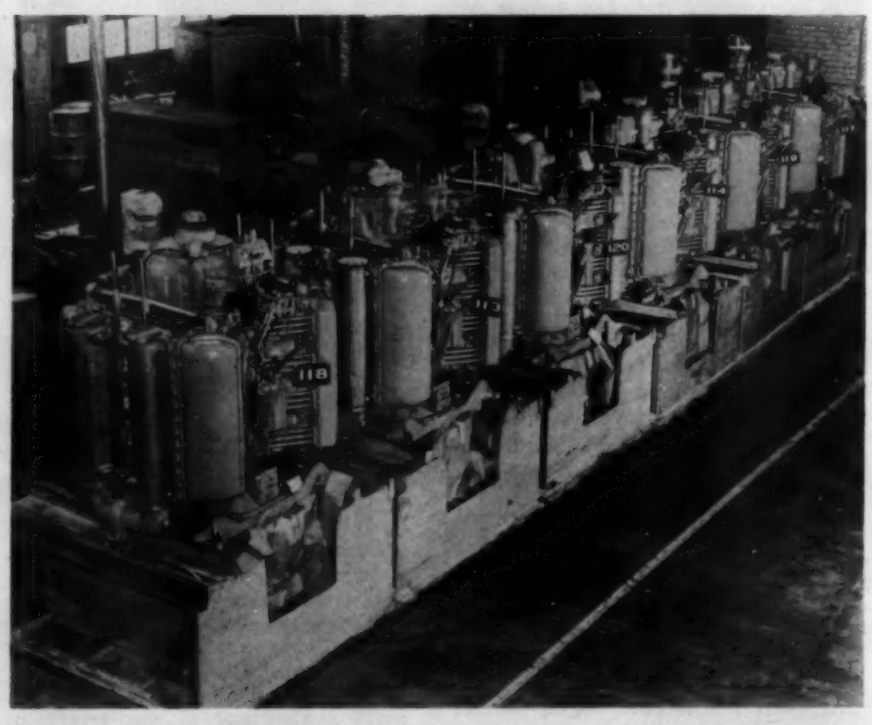
Light-Weight Diesels Increase Speed, Cruising Radius of Sub-Chasers

Electro-Motive Division of General Motors Corp. has in production a new high-speed, high-horsepower, light-weight diesel engine and variable pitch marine propeller which add materially to the cruising radius, speed and maneuverability of United States submarine-chasers.

The engine (illustrated) has been dubbed "the pancake" because of its unusual construction. Four banks of four cylinders each are located around a vertical crankshaft. The engine, reduction gear and propeller pitch control are designed as a complete unit using a bevel pinion and gear between the engine and propeller shaft.

Because of the use of the reversible propeller there is no necessity for reversing the engine, or for providing reverse gears for the propeller shaft. Every effort has been made to reduce weight of the complete installation and the engine is believed to be the lightest ocean-duty diesel engine in the world. It occupies about one-third the space of the best previous diesel engines of the same high horsepower.

Weight and space gained by the use of the new engine and propeller can be utilized for more fuel for greater range, or for additional armament and ammunition; lighter overall weight for more speed or for the installation of more engines to give greater speed. In actual current practice a combination of all these gains is designed into the newer sub-chasers.



BATTERY of high-speed, light-weight General Motors "pancake" diesel engines which the Navy department discloses are materially increasing speed, cruising radius and maneuverability of the newer U. S. subchasers

possible—and consumers can help greatly in this crisis by investigating the carbon steels."

Whereas most machine tool builders at present are perplexed as to what steels they are to use in the future, with some of them studying the possibilities of certain NE steels like 8744 and 8620, the comfortable position of one New England machine tool builder is cited as an example of what can be done.

A couple of years ago this machine tool builder became sold on advantages of induction hardening of parts made of carbon steel. This involved some parts redesign but on the whole the job of converting proved to be a simple one. Even his most exacting requirements — for spindles—are taken care of by X1340. He uses no alloy steels whatever and as a result is having no difficulty in getting needed steel.

It seems logical to assume that NE steels will be designated for certain military and essential items requiring low-alloy material. At the same time, metallurgists point out that a good deal more experimental work will have to be done before the NE steels are understood and their applications determined.

NE Steel Output Small

While output of NE steels is increasing, only a few companies so far have gotten into production of them on a substantial scale. Other companies have produced NE steels only in small lots for test purposes. In quite a few instances NE steels have been produced by happenstance—because the compositions of occasional heats happened to fall within range of one or another of the NE steels. This is because of residuals of the alloying elements which are carried over from the scrap used in making the steel.

Some thought is being given to setting up NE steels to have lower nickel and chromium content than the 0.40 to 0.60 range in the present NE steels. This would fill a gap in the present NE list since it would accommodate many heats that now contain lesser amounts of nickel and chromium.

Steelmakers are concerned over the fact that large quantities of nickel and other precious alloys now are wasted because of present scrap practice. This cannot be changed without a governmental directive since the present system provides for full operation of steelmaking facilities with shipments of product governed by allocations and priority ratings. Under this system available scrap must be used to get maximum production.

For example, chromium-nickel-molybdenum steel scrap constitutes quite a large percentage of the total scrap supply because of the analyses to which the steel industry has been working in the war program. Fully half of the alloy content of this scrap is lost in the form of residuals. A large amount of steel in the aggregate which is not meant to have any nickel, or molybdenum, or chromium, content, frequently bears more than half of 1 per cent of any one or more of these alloys.

It is freely stated in the steel industry that "we have been losing more alloys in this way than Germany has available." This wastage could be prevented by switching open-hearth furnaces over to the job of melting alloy scrap, analyzing the resulting ingots. Thus, these ingots of known analysis later could be used in producing desired alloy steels.

REVISIONS AND ADDITIONS TO
PRIORITIES—ALLOCATIONS—PRICES
as published in Section Two of STEEL, July 6, 1942

M ORDERS

M-15-b-1 (Amendment): **Rubber,** effective July 1. Establishes specifications for manufacture of airplane tires.

M-19 (Amendment): **Chlorine,** effective July 6. Places producers' shipments of calcium hypochlorite and chloride of lime under allocation. Producers file PD-574 with WPB by 10th each month.

M-21-g: Heat-Resistant Chromium or Chromium-Nickel Alloy Iron and Alloy Steel, effective July 2. Sets up maximum specifications for chromium and nickel in alloy steels used in metallurgical furnaces, oil refineries, synthetic rubber plants, cement mill furnaces and power plant equipment.

M-36 (Amended): Manila Fiber and Cordage, effective July 4. Cuts processing of cordage to 37% and sale and delivery to 41⅛% of 1939 rate. Previous limitation was 70% for all three. Prohibits cordage delivery for shipbuilding and delivery of cordage less than 4½-inch diameter for use on cargo and passenger vessels. PD-576 filed with WPB by 20th of month for authority to accept cordage deliveries the following month.

M-38-j: Lead, effective July 4. Establishes monthly lead pool at 15% of production in second preceding month, to continue until further notice.

M-61 (Amended): **Madagascar Flake Graphite,** effective July 7. Permits jobbers to acquire graphite crucibles without application for authorization. Requires persons other than jobbers to file PD-575 after Aug. 1 with WPB for authority to accept delivery. Applicants for Madagascar flake graphite to manufacture crucibles file PD-303B.

M-123 (Amended): **Asbestos Textiles,** effective July 4. Permits use in manufacture of brake linings, clutch facings and other woven friction materials without an A-10 rating.

M-183: Phosphate Plasticizers, effective Aug. 1. Provides for complete allocation control. PD-558 filed with WPB by 15th each month to authorize use or delivery of more than 100 lbs. monthly. Producers file PD-557 by 24th each month.

M-187: Sunn Hemp, effective July 3. Restricts use largely to manufacture of marine oakum.

M-194: Cattle Hides, Calf and Kid Skins, effective July 3. Provides for allocation.

L ORDERS

L-1-g (Amendment): **Trucks, Trailers, Busses,** effective June 4. Redefines truck trailer to mean a complete semi-trailer or full trailer having load-carrying capacity of 10,000 lbs. or more, designed for transportation of property or persons.

L-13-a (Amendment): **Metal Office Furniture, Equipment,** effective July 1. Prohibits metal shelving manufacturers from accepting orders except when authorized by WPB on PD-423 for war purposes.

L-49 (Amendment): **Beds, Springs, Mattresses,** effective July 3. Extends restrictions on use of iron and steel by manufacturers during July to 65% of average rate in year ended June 30, 1941.

L-83 (Amendment): **Industrial Machinery,** effective June 30. Delivery restrictions extended to new woodworking, sawmill and logging machinery and equipment costing more than $250.

L-98 (Amendment): **Sewing Machines,** effective July 7. Extends period for manufacture of repair parts through Dec. 31, 1942, permitting iron and steel use at 125% of average monthly use in two years ended Dec. 31, 1941, nonferrous metal use at 100% of base period rate.

L-120: Paper, effective July 4. Sets up standardizaztion and simplification practices for the paper industry.

L-128 (Amendment): **Chromium and Nickel in Automotive Valves,** effective July 6. Removes Army, Navy and Maritime Commission purchases from order restrictions.

L-158: Automotive Replacement Parts, effective July 4. Supersedes L-4, L-4-c and L-35. Permits parts production in third and fourth quarters up to following limits: For passenger cars and light trucks, up to 70% of sales in 1941 period if inventory not in excess of four-month supply, otherwise up to 50% provided inventory not increased during quarter; for medium and heavy trucks, trailers, busses and off-the-highway vehicles, up to 125% or 75% under same limitations as for passenger cars and light trucks. Consumers must turn in used part for each new one received. New part may not be sold if replaced one can be reconditioned.

P ORDERS

P-98 (Amendment): **Petroleum Industry Materials,** effective June 30. Extends order through July 31, 1942. Forbids companies required to operate under Production Requirements Plan from extending ratings except under PRP.

PRIORITIES REGULATIONS

No. 13: Sale of Idle Materials, effective July 7. Provides uniform rules governing sales of idle or excess materials.

(Please turn to Page 146)

WINDOWS of WASHINGTON

By L. M. LAMM *Washington Editor, STEEL*

Frozen inventories of critical war materials freed by WPB order . . . Relief for steel warehouses under consideration . . . Production of plastic molding machinery restricted

WASHINGTON

HUNDREDS of thousands of tons of critical materials now frozen in idle inventories will be freed for vital war production by a regulation issued last week by WPB.

The new order, Priorities Regulation No. 13, affects thousands of business concerns who have in their possession materials worth hundreds of millions of dollars which cannot now move freely in industrial channels because of war regulations.

In effect, the regulation sets up new and uniform rules governing the sale of idle inventories of certain kinds and removes such specified sales from the existing regulations which affect the normal flow of material.

No specific estimates of the amounts of materials which can be salvaged in this way are available. However, the total is known to be extremely large, and in the case of copper and copper base alloys alone, for example, it is believed that some 250,000 tons of this metal can be freed by the new step.

An example of the simplified procedure effected by the new regulation is afforded by the case of a domestic refrigerator manufacturer who had on hand a large stock of copper tubing when prohibition of any further refrigerator production became effective. The tubing was badly needed by a firm, in the same city, which was turning out tank assemblies. By the terms of Limitation Order L-5-c, transfer of the critical material could not be made until official approval, obtainable after application to WPB, had been secured. Now such a sale may be made without formalities of any kind. The seller would not even be required to make a report of it.

During the period of emergency conversion to war production, it was necessary at times to immobilize some stocks of scarce material. Now that the conversion program is well under way, the flow of these materials into the war effort can be greatly increased. Effect of the new regulation is to simplify the necessary procedures.

Reserved for specified purchasers is "War Material", consisting of some 150 materials listed in Schedule "A" to the regulation. This material now may be sold to the armed services, Maritime Commission, and certain other government agencies. In addition, sales of war materiel, as defined, may be made to persons who qualify by belonging to a class listed in Schedule "A" as being eligible to receive it.

Proposal for Relief of Steel Warehouses Studied

WPB and other government agencies, including the Army and Navy, are currently studying a proposal which will assure a steady flow of steel products required by war industries to warehouses for distribution by them in small quantities, according to J. R. Stuart, head of the government agency's Warehouse Unit.

"It is probable, however," Mr. Stuart said, "that any such plan will be accompanied by further limitations on the types of orders on which steel may be sold from warehouse stock."

Mr. Stuart said that the present condition of steel warehouse inventories of heavy steel products is definitely alarming.

"The importance of reasonable stocks of steel in warehouses serving war industries cannot be overestimated," declared Mr. Stuart. "To supply the demands of small quantity buyers and to meet emergency situations which arise from time to time is a function which cannot readily and economically be performed by steel producers.

"It is only through the service which steel warehouses are able to give that uninterrupted war production schedules can be maintained."

Mr. Stuart's statement followed publication of reports recently that production of vital equipment required for the war effort was slowing down due to inability to obtain the necessary steel.

Group Classification Requirements Revised

Iron and steel producers have been advised they may accept from their customers purchase orders covering material for more than a single group classification. This advice was included with the instruction that, for the present, orders must continue to carry the Group Classification certification in addition to the new symbols set up by the Allocation Classification System.

Order M-21 heretofore required a separate purchase order for each group classification for which material was being purchased. While this is no longer necessary, producers point out that it is highly important for buyers to indicate what part of the total order is intended for each of the various groups covered by the order. This breakdown should be shown in pounds or tons, the War Production Board has advised.

Buyers gradually are becoming acquainted with the fact that the Group Classification certification has not yet been dropped, despite required use of Allocation Classification symbols. Another misunderstanding has appeared, however, this one regarding use of the former certification on orders for fabricated steel products. Actually, the group classification setup of Order M-21 applies only to iron and steel castings and semifinished and finished rolled or drawn carbon alloy steels.

Plastic Molding Press Manufacture Restricted

Specifically defined restrictions on production and delivery of new plastics molding machinery are imposed by provisions of Limitation Order L-159.

Action was taken to prevent production of such machinery for nonwar purposes and to assure an adequate supply of the machinery for manufacture of plastic articles needed in the war production program.

Such machinery includes: Plastic injection molding presses; compression molding presses, hydraulic, automatic, mechanical; extrusion molding presses; preforming presses; laminating presses; tube and rod molding presses; tube rolling machines; plywood veneer presses.

Discuss Production of Usable Copper from Yellow Brass Scrap

Methods of producing usable copper from yellow brass scrap were discussed by the brass and bronze ingotmakers industry advisory committee in Washington last week. The opinion was expressed by industry representatives that about 1000 tons of 86 per cent black copper might be produced by ingotmakers from this relatively plentiful type of scrap. Black copper is the industry's name for the product of the smelter which has not been refined.

To produce acceptable black cop-

per with copper content of 86 per cent in the reverberatory type furnaces operated by most ingotmakers places heavy burdens on the ingotmaker's equipment. In order to get 85 to 90 per cent copper content, it was said, the life of furnace lining would probably be reduced one third. Further difficulties appeared in the amount of smoke and zinc oxide which would be discharged into the air.

An alternative program, the production of 80 per cent black copper, which would not present such production problems, was discussed. The proposal is that this copper might be sent to smelters, with unused capacity, for conversion into 98 per cent blister copper, which will then be refined into electrolytic copper. It is thought that as much as 10,000 to 15,000 tons of new copper per month might be turned into war production if this program can be worked out.

Eighty Per Cent of Federal Expenditures for War Purposes

Eighty per cent of total federal government expenditures during fiscal year 1942, which ended June 30, were for war activities, Secretary of Treasury Morgenthau announced last week. War outlay amounted to $25,954,000,000; total expenditures were $32,397,000,000.

Army, Navy and lend-lease outlays, he said, were 25 per cent of the national income. For fiscal year 1943, now starting, 55 per cent of the national income, or about $67,000,000,000, will go for war purposes.

Last fiscal year's expenditures were only $6,000,000,000 less than the entire cost of the first World war.

A record deficit of $19,598,000,000 raised the public debt to $72,422,000,000, exclusive of other guaranteed government obligations of $4,568,259.630. Per capita debt now is $538.56, compared with $12.36 on March 31, 1917.

Report Forms To Be Checked To Save Industry Paper Work

Close check on issuance of new WPB forms requesting information from industry will be provided by a new committee announced by WPB chairman Donald M. Nelson.

Committee will review all previously issued WPB forms and will recommend abolition or consolidation of them wherever possible.

Unit will have full authority to refuse approval of new forms or to discontinue the use of existing forms. It will be known as the Committee for the Review of Data Requests from Industry.

Whenever a form is found to be unnecessary, its use will be stopped immediately. However, all forms now in use will continue in effect until Oct. 1 unless specific notice is given to the contrary.

Joseph Lubin, chairman of the new committee, is a member of the firm of Eisner and Lubin, certified public accountants, New York. Other members of the committee will be representatives of the War Department; Navy Department; Materials Division, Statistics Division, Bureau of Industry Branches and Bureau of Priorities, WPB; and Bureau of the Budget.

Roumanian-Owned Forge Equipment Seized by U. S.

Alien Property Custodian Leo T. Crowley has seized the holdings of Edgar Ausnit, a Roumanian national now resident in the United States on a temporary visitor's visa, in the forge equipment for a bomb and shell manufacturing plant, and made this equipment available to the United States Navy.

The equipment, which is capable of producing 500 and 1000-pound bombs and large caliber shells, was manufactured in 1939 for Roumanian interests, known as the Iremece Co. of Bucharest, but because of a shortage of shipping facilities it has been lying idle at a Brooklyn pier.

British and Netherlands interests have sought to purchase the equipment on several occasions, and the United states Navy has recently been anxious to acquire it, but these sales have been blocked by the Roumanian owners. The action of the alien property custodian has now made the plant equipment available for American war production, and the Navy is taking steps to place it in immediate use in a plant now nearing completion.

At the same time, the custodian also seized all Ausnit holdings in the Cisatlantic and Cisoceanic Corps., holding companies which Ausnit incorporated in New York in 1938. These two corporations own a substantial amount of cash and large holdings in important American corporations

Operating through Cisatlantic and Cisoceanic, Mr. Ausnit in December, 1941, purchased the interest of Iremece of Roumania in the bomb and shell equipment.

Mr. Crowley's office also has taken over control of General Dyestuff Corp., Byk Inc., and Siemens Inc., all of New York, and Ajax Transportation Co., Nashville, Tenn.

General Dyestuff has been the selling agency for General Aniline & Film Corporation. Control of the latter company was vested by the alien property custodian several weeks ago. With assets of $6,000,000, General Dyestuff's 1941 sales exceeded $22,000,000.

Byk Inc., is a subsidiary of a large German pharmaceutical company and manufactures chemicals and drugs in the United States under patents and trademarks acquired by it from the parent company.

Siemens Inc., was the United States representative of Siemens & Halske, A. G., of Germany, one of the largest electrical and radio equipment manufacturers in the world. Siemens also owns a number of patents which it holds by assignment from its parent company and which now come under control of the custodian.

Ajax Transportation Co., heretofore owned by Fritz von Opel, is engaged in the transportation of gasoline by tank car.

Maximum Alloy Specifications Set Up for Heat-Resistant Steel

Heat-resistant steel alloys have been scaled down to a wartime basis to conserve nickel and chromium.

Order M-21-g sets up maximum specifications for heat-resistant alloys used in metallurgical furnaces, oil refineries, synthetic rubber plants, cement mill furnaces and power plant equipment.

The new specifications are designed to use the least possible amount of alloying materials necessary to maintain the effectiveness of the equipment involved. Savings in nickel are expected to be in excess of 10 per cent of the annual consumption of the metal.

The order does not apply to heat-resistant steels for the armed services where specifications call for more nickel and chromium than the schedules set up in the order. Exceptions also are granted to materials fully fabricated at the effective date of the order and to materials under contract where it would not be practical to change specifications, provided that delivery is made within 60 days.

Permanent Lead Pool Formula Established

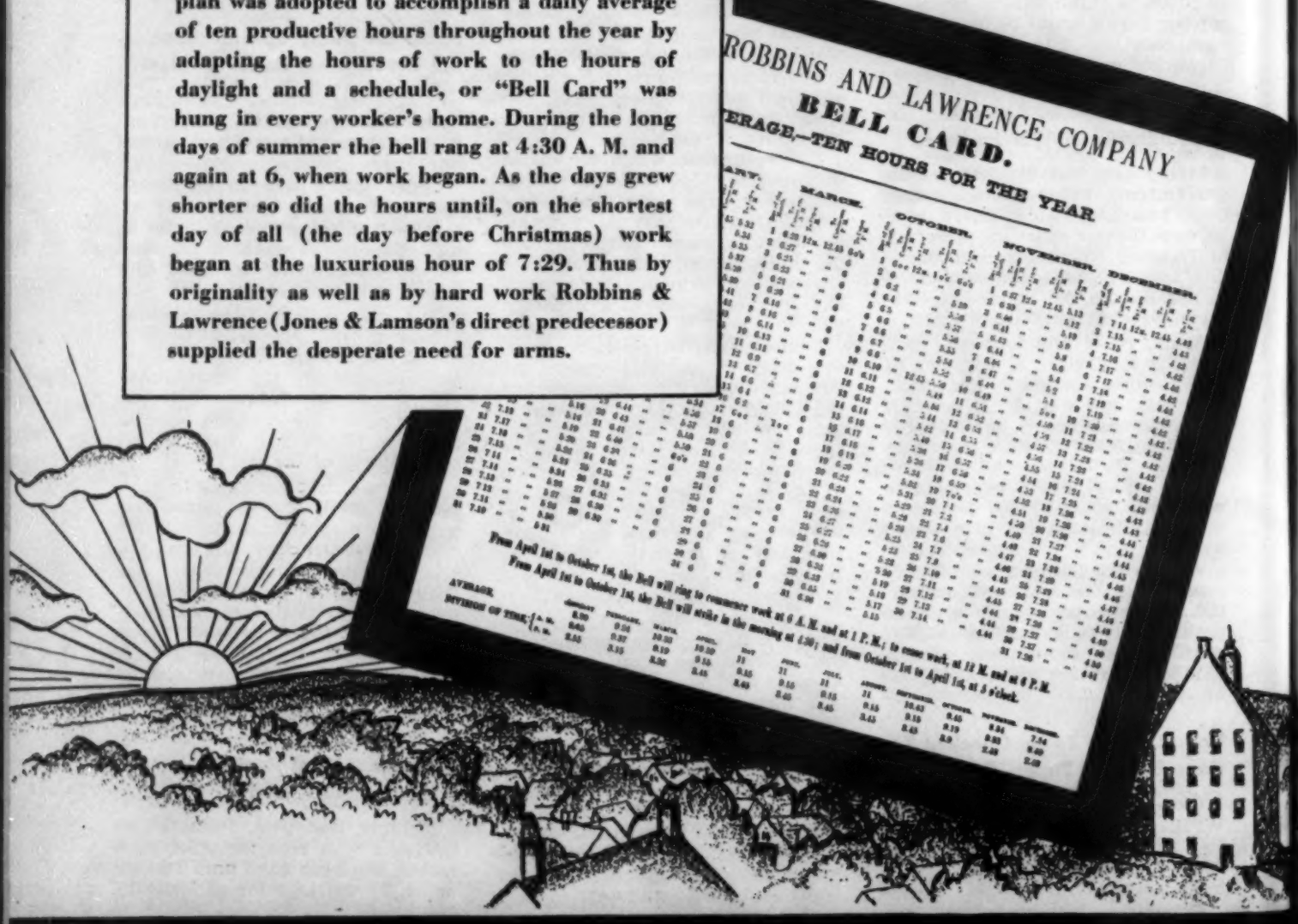
Monthly lead pool, formerly established by a separate order each month, has been fixed until further notice by the Director of Industry Operations.

Order M-38-j specifies that lead refiners shall set aside each month, beginning July, 15 per cent of the quantity of lead they produced in the second preceding month. Thus July's pool will be 15 per cent of May production.

The lead pool has been stationary at 15 per cent for the past several months.

The Bell

During the Crimean War (1854-56) a Vermont village hummed with the well-ordered haste of war-time production as Robbins & Lawrence sped the filling of their contract for 25,000 Enfield rifles for England. New buildings were erected and new machinery designed, built and installed, but still work was limited by the hours of daylight. To beat uncooperative nature a plan was adopted to accomplish a daily average of ten productive hours throughout the year by adapting the hours of work to the hours of daylight and a schedule, or "Bell Card" was hung in every worker's home. During the long days of summer the bell rang at 4:30 A. M. and again at 6, when work began. As the days grew shorter so did the hours until, on the shortest day of all (the day before Christmas) work began at the luxurious hour of 7:29. Thus by originality as well as by hard work Robbins & Lawrence (Jones & Lamson's direct predecessor) supplied the desperate need for arms.



FAY AUTOMATIC LATHES

AUTOMATIC THREAD GRINDERS

OPTICAL COMPARATORS

AUTOMATIC OPENING DIE HEADS

Rang at 4:30 a. m.

INDUSTRIAL production has travelled far since the days of the "Bell Card" but again the time comes for heroic effort as America, "Arsenal of Democracy," supplies not only its own war needs, but those of half the world in this time of struggle.

No need now for "daylight saving" plans as brilliant, modern lighting speeds production for full twenty-four hours. But there is still need, and there always will be need, for pioneering ideas in industry.

For ideas as new and as sound as those that vitalized this neighborhood years ago Industry can look to Jones & Lamson . . . ideas that will help you in today's emergency and in the hard times that lie ahead.

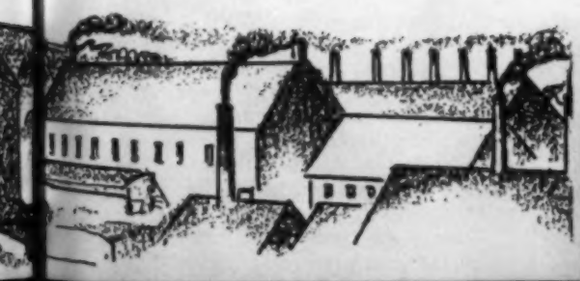
Inquiries from large or small companies all receive the careful, detailed study of our engineers.

JONES & LAMSON
MACHINE COMPANY

Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . . Automatic Opening Threading Dies and Chasers

Springfield, Vermont

U. S. A.



PROFIT PRODUCING
MACHINE TOOLS

SADDLE TYPE
UNIVERSAL TURRET LATHE

RAM TYPE
UNIVERSAL TURRET LATHE

Pilot Plants for Producing Sponge Iron Planned by Bureau of Mines

WASHINGTON

PLANS for an immediate study of various methods of producing sponge iron and for the erection of pilot plants to guide future operations in the field have been launched by the Bureau of Mines, it was announced by Dr. R. R. Sayers, director. The bureau's report of what it expects to do is as follows:

"Funds totaling $600,000 have just been made available by the Congress, under the head of 'war prosecution' activities in the Interior Department, for the bureau to develop methods of utilizing untouched iron ore deposits in this country and to assist in alleviating a shortage of scrap iron now believed to be retarding steelmaking.

"Sponge iron—so-called because it is granular and porous—is the product of a process whereby metallic iron is obtained directly from iron ore without going through the liquid stage such as that employed to produce pig iron in a blast furnace. With natural gas or coal as the reducing agent, the oxygen is taken away from the ore at a temperature below the melting point of the iron or the iron oxide. The process is adaptable to smaller and therefore less expensive plants than the standard blast furnace installation, and produces an iron which is low in carbon and therefore is comparable to scrap.

"A number of sponge iron reduction processes are known to be workable, Dr. Sayers informed Secretary of the Interior Harold L. Ickes, but none of them has been applied commercially on a large scale to United States iron ores because the standard reduction methods have produced a sufficient supply of iron in the past. As the war proceeds, the scrap shortage may become more acute and sponge iron can take its place, he added.

Experiments Prove Feasibility

"Past experiments of the Bureau of Mines and of others have shown the feasibility of reducing iron ore directly with reformed natural gas or coal, Dr. Sayers stated, and it is with these two processes that the bureau's initial work will be concerned in the emergency program. Any success attained would not tend to displace the existing industry, but merely would supplement the present inadequate facilities in order to meet greatly increased demands for iron to manufacture steel for guns, tanks, ships, and other war goods.

"As long ago as 1927, the Bureau of Mines investigated the direct reduction of iron ores, and in 1936 the bureau published a bulletin describing sponge iron experiments in California conducted by Charles G. Maier, an engineer of the metallurgical division, with reformed natural gas as the reducing agent. This is known as the 'gaseous reduction process,' which means reduction with carbon monoxide or hydrogen. The carbon monoxide passing over hot ore reacts with the oxygen in the ore to form carbon dioxide and produces metallic iron. Coal of the noncoking type—and therefore less expensive—can also be used in another direct reduction process.

Methods To Be Tested

"As preliminary study is undertaken to determine which of the various processes is more suitable to current needs, the bureau plans to make a survey of possible locations for two 30 to 50-ton a day pilot plants to test the various methods. The furnaces and other equipment in this pilot plant are expected to cost about $500,000 and to provide practical means of determining how and where large-scale industrial plants may operate successfully.

"While it is too early to announce a definite location for the pilot plants, Dr. Sayers said that they probably would be erected near large or unused iron ore deposits, depending upon a suitable supply of natural gas or coal. Operation of the plant, as well as direction of the research work, will be under the supervision of Dr. R. S. Dean, assistant director of the bureau.

"Because of its low carbon content, sponge iron is an 'ideal' substitute for scrap iron to mix with ordinary pig iron in manufacturing steel, according to bureau metallurgists. Sponge iron plants can be built on a smaller scale than blast furnaces, and small deposits of ore —too small to supply a modern blast furnace—can be used to supply ore to a sponge plant. High-purity soft iron, containing only a small percentage of silica and free carbon, is being demanded by electrical manufacturers particularly for armatures. Iron produced by the gaseous reduction of high-purity iron oxide should provide this necessary war material.

" 'When the processes are proven and the bureau's equipment developed to a point where immediate commercial production could begin, the scrap situation in this country can be largely alleviated in a few months' time thereafter,' Dr. Sayers stated.

" 'The installation of sponge iron plants in the United States would not interfere with the operation of the blast furnaces producing pig iron for the successful prosecution of the war. They would permit the continued operation of the large blast furnaces in the steel mills, aid in continuing the fullest operation of open-hearth furnaces, and provide iron with special properties for other uses, particularly for the electrical industry.' "

War Savings Promotional Material Available

Treasury Department is making available to business and industrial companies promotional material designed to encourage the diversion of at least 10 per cent of payrolls into War Savings Bonds.

Nearly 100,000 firms already have installed systems whereby employes buy bonds systematically through voluntary allotment of a portion of their wages or salaries.

The promotional material includes booklets explaining the plan, telling how it may be installed and operated, a pamphlet for employes stressing both the patriotic and the investment angles, and pay envelope stuffers to remind and presell employes on the plan.

Lapel buttons and window stickers reading "I am buying at least 10%" also are supplied. When the entire business has signed up for a minimum 10 per cent payroll, it is authorized to acquire and display the official Treasury Department Target Flag.

Material is distributed through the offices of the War Savings Staff's state administrators and employers may obtain needed quantities by calling local offices.

Metal Shelving To Be Built Only for Armed Services

To prevent manufacture of metal shelving for any but the most important purposes, the WPB has, in Amendment 3 to L-13-a, ordered manufacturers to accept no orders except those specifically authorized by the Director of Industry Operations. Authorizations will be issued only for direct delivery to the armed services or Maritime Commission.

Before the amendment, shelving manufacturers were permitted to make during a three-month period, 50 per cent of the amount manufactured in a base period. In addition, they were permitted to accept orders from the armed forces provided delivery was made before July 15.

Amendment terminates the 50 per cent quota provisions, and prohibits the placement of new shelving orders except where authorized.

Appeals Branch Set Up To Handle Requests for Exceptions to M-126

WASHINGTON

MANUFACTURERS' appeals for relief from restrictions imposed by Order M-126, which prohibited use of iron and steel in hundreds of civilian articles, will be passed upon by a new Appeals Branch, set up within the Bureau of Priorities to handle all requests for exceptions to conservation and limitation orders.

Appeals section of the Iron and Steel Branch, which has been operating in New York, will be recalled to Washington.

For the present, the Appeals Branch will consider only requests from firms affected by M-126. Later, it will take over the handling of appeals from manufacturers covered by certain other conservation and limitation orders, but in the meantime all queries and requests concerning these should be addressed, as formerly, to the appropriate material or industry branch.

Appeals from the terms of General Conservation Order M-126 must continue to be made on Form PD-437 and filed with the nearest WPB field office, together with any additional evidence which a manufacturer who considers himself subjected to undue hardships believes would be helpful to his case. After a preliminary processing in the field offices, the appeals will be forwarded to Washington for final decision.

Communications concerning M-126, other than the filing of appeals, should be addressed to the Appeals Branch, Bureau of Priorities, War Production Board, Washington.

In general, granting of appeals will be considered only after it has been determined that no other adequate relief is available to the applicant. Relief available in many cases without granting an appeal from the terms of a WPB order includes:

1—Assistance in disposing of frozen inventory materials to other companies permitted to use them, or to government agencies.

2—Re-sale to the source of supply.

3—Assistance in obtaining war orders or in conversion of facilities to direct war production.

4—Advice on obtaining financial assistance from the Bureau of Finance in the Division of Industry Operations.

5—Assistance in the disposal of idle production equipment.

When an appeal is filed for permission to assemble processed inventories in excess of the terms of limitation or conservation orders, full description of inventories on hand should be enclosed.

An Appeals Board has been formed, under the chairmanship of Dr. A. N. Holcombe, professor of government at Harvard, who recently has been acting as consultant to Donald M. Nelson, WPB chairman. The board will decide all appeal cases in accordance with established WPB policies, and the precedents it sets will guide the Appeals Branch in its active administration of relaxations of the terms of conservation and limitation orders.

Restriction on Use of Metals In Household Utensils Extended

Restrictions on the use of iron, steel and zinc in the production of essential kitchen and household articles were extended through July in an amendment to General Limitation Order L-30.

Order carries a 10 per cent cut in the amount of iron and steel to be used in the manufacture of cooking utensils and a 30 per cent reduction in the amount of iron and steel to be used in the manufacture of kitchen ware and essential household articles. A 50 per cent cut is ordered in the amount of zinc to be used in the manufacture of kitchen ware and essential household articles.

The reductions are based on the amount of all metals used in the production of such articles during the year ended June 30, 1941.

No nickel may be used in the production of a list of household articles which can be made of other materials. They include tie racks, shoe trees, fireplace equipment, towel bars and racks, toothbrush holders, soap dishes, fly swatters, dish drainers, cuspidors, vegetable bins, carpet beaters, etc.

Civilian Board Will Advise Army's Ordnance Chief

CIVILIAN board which will advise Maj. Gen. Levin Campbell, chief of ordnance, in formulating policies for the training of thousands of technical men needed for field maintenance work of the ordnance department are shown at the board's first meeting. Left to right: Karl T. Compton, president, Massachusetts Institute of Technology; J. E. Johnson, training service director, General Motors Corp.; H. P. Hammon, dean, Pennsylvania State College; Ivan C. Crawford, dean, University of Michigan; General Campbell; Brig. Gen. Julian S. Hatcher, commanding general of the Aberdeen, Md., proving ground; Lt. Col. Harold J. Conway, ordnance staff; Alex R. Stevenson Jr., assistant to vice president, General Electric Co.; Robert E. Doherty, president, Carnegie Institute of Technology; Arthur C. Willard, president, University of Illinois; and K. T. Keller, president, Chrysler Corp. NEA photo

PUT THE HEAT ON TOKYO WITH TOCCO

A STANDARD UNIT. *TOCCO can be adapted to post-war jobs by simply changing the work fixture. Application shown is brazing of shell adapters.*

• Pearl Harbor—Manila—Wake—Singapore—Java—Bataan—Corregidor—Burma!

Are *you* using all your ingenuity and resources to turn this tide?

Are you using advancements such as Speedy TOCCO to multiply output of armament so that our boys can really put the heat on Tokyo and all Axisland?

Standard TOCCO Induction Heat Treating equipment is speeding production of the war material listed here. Other applications are being developed daily.

Consult us today on these or the many other applications of TOCCO Induction Heat Treating.

TOCCO *Induction Heat Treating Speeds Production of . . .*

HARDENED
- Crankshafts
- Camshafts
- Armor Piercing Shot
- Tank Sprockets
- Track Pins
- Grouser Shoes
- Propeller Hubs
- Bar Stock

ANNEALED
- Cartridge Cases
- Aviation Tubing

BRAZED
- Shell Adapters
- Incendiary Bombs
- Burster Tubes
- Fuse Seat Liners
- Mortar Shells

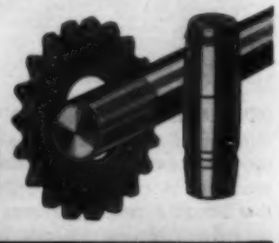
HEATED and formed
- Cartridge Cases
- Shells
- Bombs
- Gun Barrels
- Propeller Hubs
- Aircraft Screws

THE OHIO CRANKSHAFT COMPANY
Cleveland, Ohio

SPEEDY ELECTRIC HEAT IS GENERATED WITHIN THE SECTION TO BE HEAT-TREATED

TOCCO

World's Fastest, Most Accurate Heat-Treating Process



By A. H. ALLEN *Detroit Editor, STEEL*

MIRRORS of MOTORDOM

DETROIT

Turn to Help Wanted columns for executive and supervisory personnel to staff new engine plant . . . Slowing or revising of production may relieve pressure on labor supply . . . Wheeled tanks coming

DILUTION of management and supervisory personnel resulting from the demands of new and expanding war plants operated by the automotive industry is a serious problem, and one which the government, preoccupied with paternalistic coddling of workmen, gives scant consideration. The subject has been mentioned here before, but last week it was thrown again into focus by a classified advertisement in one of the local papers in which Chrysler Corp. issued a call for candidates for the job of production manager of its vast new Dodge Chicago airplane engine division.

Seldom does a corporation the size of Chrysler have to resort to the classified ads for executive personnel of the type required to hold down such an important job, and the instance is indicative of how thin present management personnel is spread over the many war plants now in operation. The Chicago plant, behind four miles of nonscalable wood fences, represents probably the largest undertaking yet assumed by any unit of the motor industry. It is common talk around Detroit that the Windy City plant could encompass the entire Ford Willow Run plant, with room left over for ten baseball diamonds. Manufacturing activities will cover a complete range of processes, including forge, foundry, machining, assembly, testing, etc.

May Employ 50,000

No figures have been released on how many will be employed, but from the indicated size of the plant a figure of 50,000 probably would not be far from the eventual total. The matter of supervising the work of such a crew, engaged in the manufacture of a high-precision product never before built by the organization, is no simple matter. While a nucleus of supervisory talent is now being trained by Chrysler, this will have to be implemented by a good many more hired from other positions.

Shortly leading tradepapers and business magazines will carry Chrysler advertisements seeking at least 50 trained executives and production supervisors for the Chicago plant, marking what is believed to be the first concentrated attempt to locate such men by this means.

Analyzing the situation, it becomes clear that the only way to unearth such experts is to lure them away from their present jobs. Call it pirating or raiding if you will, the offer likely will have to be accompanied by inducements in the form of salaries and working conditions if the men are to be found.

Certainly the attractions of an executive position in a brand new plant, supplying a product vitally needed in the war effort, should not go unheeded. If the siphoning off of key personnel from other war plants proves unsettling, it will just have to be charged up to the cost of a prodigious war effort.

There has been speculation over why the name Dodge was assigned to this new Chrysler plant at Chicago, since Dodge is but one of four principal divisions of the corporation. A company source suggests that the designation was determined in the effort to keep the name Dodge before the public eye during the wartime blackout of automobile manufacturing. The other divisions also have their wartime significance —Chrysler, of course, for tanks, DeSoto for bomber sections, and Plymouth for guns. Dodge now is supplying many war products, the most important being a variety of trucks, but by linking this famous old automotive name to an aircraft engine plant, its prestige should be enhanced, and at the same time placed on a competitive basis with Buick, which likewise is building a few airplane engines in the Chicago area.

Competition for machine operators, tool and die designers and other classes of skilled help has been keen, if not at times bitter, for many months now. Net result is that many plants, particularly in such areas as outstate industrial Michigan, find their labor supply gone, their wage rates spiralled upward viciously and many men attempting to hold down jobs for which they are not too well suited. Valuable assistance has been furnished by the programs of the Training Within Industry division of the WPB in lifting the level of quality of new labor. Recent compilation shows this type of training has been given 9062 job instructors in 137 companies in the Detroit district, benefiting an estimated 200,000 employes.

These strains incident to the makeready stage or preliminary period of war production are unfortunate in their net effect on the national economy, but doubtless will ease as industry moves more rapidly into the production phase of the program. As level of output mounts and as military strategy becomes more closely geared to production, the difficulties of the makeready stages should taper off. There have been some instances of this already. One is the case of the Murray Corp. of America here, which will complete one airplane wing contract early in September and will be forced to transfer some workmen to other jobs and even lay off a few temporarily until tooling is completed on a new contract. There will be more instances similar to this.

Many are anticipating some slow orders to develop on production of certain items which may be piling up out of proportion to other products. These would necessitate reductions in the level of employment, with the possibility that persons so displaced could be absorbed immediately in plants which are then accelerating production schedules.

Proposals to "freeze" workmen to their present jobs were being discussed actively at one time, but patently such a step would not be in the interest of "gearing production to strategy," so it has been discarded. A certain amount of fluidity in labor supply is vital to war production; the disturbing angle is that movement of men from one plant to another can be effected in few other ways than by raising wages. Enforced layoffs may prove a leveling factor in this respect—at least, some employers hope so.

Tanks on Wheels

Delays in perfecting braking systems and in final decision as to required gun calibers are slowing the start of production on combat cars or trackless tanks which at least four car builders are preparing to manufacture. Capable of speeds up to 70 miles an hour, these vehicles are really streamlined tanks on wheels and will carry armament with devastating, rapid firepower. They should prove a valuable addition to the hitting power of U. S. armed forces, since they combine the defensive features of a tank with the speed of a fast truck.

As a type of military vehicle, they are not new, pictures of Russian vehicles of this type having been published widely. American versions,

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however, will be vastly superior to the Russian designs in point of speed, firepower, streamlining and armor. One of the producers will be Ford and plans call for assembly in a Minnesota plant.

"Purp" May Help Deliveries

Though burdened with a mass of administrative problems, the Production Requirements Plan being instituted by the WPB as a successor to the former setup on priorities is being looked to as a means of a more intelligent supply of materials and equipment to war plants on a time schedule closely geared to the "when and how much" phases of requirements. Perhaps no industry is more guilty than the automotive in demanding virtually immediate delivery of large amounts of materials and equipment and then letting shipments stand around idle for weeks, even months. This is only characteristic of the follow-up policy of the motor industry which has been in effect for years.

There is more "yelling" for deliveries from Detroit buyers than from all other industry combined—and it is darned effective yelling at that. But no one knows better than these follow-up men in motor plants that the secret of efficient mass production is getting the right material at the right place at the right time and in the right amount. Too early is just as bad as too late in wartime, when the lack of material in one plant may be occasioned by too much forehandedness in another.

The case is related of a large buyer here ordering tool steel in a quantity of several hundred thousand pounds, specifying delivery Aug. 1.

A supplier, noting stipulations on the order, inquired if this was correct and was told by the buyer it was. Now, however, orders must be signed by some designated representative who takes the responsibility of accuracy of delivery dates; so when the above order was returned to the buyer for such signature, the supplier was informed a slight revision was necessary. The order came back with one-fifth of the delivery specified Aug. 1, the balance spread out over the succeeding four or five months. Proper timing of shipments is one PRP goal.

Friday was Automotive War Production day in Detroit, marking the anniversary of the organization of the Automotive Council for War Production, in reality the wartime dress of the Automobile Manufacturers Association, but with the added support of 300 suppliers of parts, equipment and materials. The day was spent by 1000 or more bigwigs of these plants in witnessing progress in Detroit war plants and in exchanging information of mutual value.

Closed meeting in the afternoon heard Robert R. Nathan, chairman of the planning committee of the WPB, speak on: "What's Ahead in the Next Six Months"; as well as industry leaders analyzing various aspects of the war production, government regulations, public opinion and kindred subjects.

Meeting was culminated by a dinner, following which Donald M. Nelson, WPB chieftain, addressed the assemblage.

A Ford engineer reportedly has been assigned to the single task of going over the Consolidated B-24 bomber the company is building at its new Willow Run plant "rivet by rivet," so to speak, with the idea of eliminating as many of the several hundred thousand rivets required in the ship as is possible within the limits of manufacturing practice and safety of performance. This will require a lengthy series of tests and it is not the intention to transfer any findings to immediate production. The move is merely suggestive of Ford thinking along the lines of simplifying manufacturing and assembly methods.

Aviation engineers will tell you that an airplane must be specifically designed for welding or for riveting (as most of them are) and the two types of joining methods cannot be used interchangeably, even if entirely satisfactory in withstanding maximum stresses. Nonstructural parts, of course, are readily adapted to welding and are already being so fabricated by many manufacturers, including Ford.

Continental Aviation & Engineering Co., subsidiary of Continental Motors, has announced plans for a new plant in this area, presumably to build airplane engines. A staff of engineers is already at work on the project in a downtown building. The new structure will feature wood trusses and concrete supports, to conserve structural steel.

Production of Spare Auto Parts Restricted by WPB

WASHINGTON

Production of spare parts for all types of automotive equipment and imposition of rigid restrictions on inventories has been ordered by WPB.

Approximately 1400 manufacturers of replacement parts for passenger cars, light, medium and heavy trucks, trailers, buses and off-the-highway vehicles are affected by the order, L-158, which covers the two remaining quarters of this year and supersedes all previous orders, L-35, L-4 and L-4-c, relating to spare parts.

Parts to be produced under the terms of the order represent the minimum number required to retain the efficiency of the country's motor transportation system. Because of the rigid production and inventory restrictions, it is expected that high priority assistance will be made available to parts producers so that essential motor vehicles can be maintained for the duration.

Important feature of the order, which is expected to make available to the national scrap pile a quantity of scarce materials almost equal to that involved in the production of new spare parts, is a provision requiring consumers, after July 15, to turn in to distributors a used part before accepting delivery of a new part. In addition, the order provides that no new part may be sold or delivered to a consumer to replace a part which can be reconditioned by a distributor.

Two Bases Provided

During the third and fourth quarters this year, producers will be permitted to manufacture parts on either of two bases.

Manufacturers of parts for medium and heavy trucks, trailers, buses and off-the-highway vehicles may make up to 125 per cent of their sales of these parts during the same period last year, provided their overall inventory of parts does not exceed a four-month supply. On the other hand, if their inventory exceeds a four-month supply they may manufacture up to 75 per cent of their sales during the same period in 1941, provided they do not increase their inventory position at the end of each calendar quarter over what it was at the beginning of each calendar quarter.

Manufacturers of spare parts for passenger cars and light trucks may make up to 70 per cent of their sales during the corresponding quarter last year, provided their overall inventory does not exceed a four-month supply. If their inventory is in excess of this amount, they may manufacture up to 50 per cent of their sales during the same period last year, provided they do not increase their inventory position at the end of each calendar quarter over what it was at the beginning of each calendar quarter.

Cramp's Shipyard Ready To Start Operations

Rehabilitation of Cramp's shipyard, Philadelphia, started in the fall of 1940, has been substantially completed and the plant now is geared for all-out production. Company officials predict the building of cruisers, submarines, fleet tugs and the repair and conversion of other ships will be completed ahead of Navy schedules.

Employment at the yard has been increased from 30, when the rehabilitation program started, to approximately 10,000.

MEMORABLE WORDS OF GREAT AMERICANS

DANIEL WEBSTER

"God grants liberty only to those who love it and are always ready to guard and defend it. Let our object be our country. And, by the blessing of God, may that country itself become a vast and splendid monument, not of oppression and terror, but of wisdom, of peace, and of liberty".

Daniel Webster—Illustrious Defender of the Constitution, through his great statesmanship, fought to keep this country a united people.

THERMALLOY the "EYE" of QUALITY
THE ELECTRO ALLOYS COMPANY
CASTINGS FOR HEAT CORROSION
ELYRIA, OHIO
QUALITY CASTINGS SINCE 1919

Conveyor Belts Speed Assembly Of Plane Parts

SANTA MONICA, CALIF.

POWERED assembly lines are no longer new to the aircraft industry, for they are now the accepted and established technique in many leading plants. But mechanization today is going beyond the major assembly of wings and fuselages, is bringing its speed and efficiency to the production of small and important subassemblies.

At Douglas Aircraft Co.'s plant here large numbers of parts and subassemblies for military airplanes now flow steadily along a moving belt conveyor.

Developed as an experiment and set up in a department which produces a large variety of units ranging from cockpit enclosures to pilots' seats, the new conveyor is reported to have demonstrated its value in increased output, decreased spoilage, and more effective use of working time and energy. It was developed and installed by co-operating groups.

An endless canvas belt stretches several hundred feet, between men and machines arrayed along both sides. Moving over rollers slowly it carries parts and materials down the line past scores of working positions.

Operating through all shifts, the belt moves at a speed so timed that each part placed on it arrives at the right working position at precisely the right moment.

A schedule given each man at start of every shift tells him what jobs he is to work on and the exact time materials will arrive on the belt. Every man specializes in certain tasks. When his share is completed, he places the unit back on the belt, which carries it down the line to the next scheduled station.

The various machines, jigs, and assembly benches which comprise these stations are so planned and arranged that the sequence of production is straight-line, with no unit ever having to backtrack along the conveyor.

Further savings in time and steps are derived by eliminating the need for a tool crib in the department, and suspending all hand tools such as rivet guns and drills from a rack running above the conveyor. This rack provides power and compressed air outlets at regular intervals.

No time is lost in event of broken tools, for leadmen make replacement or provide a spare until tool men make their regular circuit of the line to inspect tools for necessary repairs.

To ensure conformance with specifications and standards at all stages, inspectors are stationed at several regular posts so that they may examine work moving by. Another inspector is at the end of the belt. The only man to take finished subassemblies off the belt, this inspector scrutinizes the units before placing them in trailer cars for delivery to the assembly line.

Since each man along the line specializes in a certain task, the leadmen can easily determine whose work was faulty in the case of any rejected part. Thus an educational advantage, for the leadman can explain what had been done wrong and avoid future mistakes and spoilage. Reworks in this department are now but one-tenth of what they were before establishment of the moving belt conveyor.

◆

OVERALL view of new moving belt conveyor installed for production of parts and subassemblies

Below, employe working along the conveyor completes his specific job on a part, swings around in his chair and places the part back again on the belt, which will carry it along to the next scheduled station

American Capital Aids Mexican Steel Industry; To Build New Mill

NEW YORK

FURTHER developments of the Mexican iron and steel industry, by United States capital, is indicated by negotiations for the purchase of La Consolidada (The Consolidated) by Paul Shields, senior partner, Shields & Co., 44 Wall street, and unannounced associates, at a cost of approximately $5,000,000.

The Mexican company has properties in Peralvillo, a suburb of Mexico City, and Piedras Negras, in the northern state of Coahuila, and is engaged in the production of nonferrous and ferrous products.

Early culmination of present negotiations is believed probable, and while no immediate expansion is contemplated, should the ownership change a gradual development of the properties along existing lines is considered likely.

The second largest of the two companies having steelmaking facilities in Mexico (second to Monterrey Iron & Steel Works), the company has an open-hearth furnace with annual capacity of 22,000 tons and two electric furnaces with combined annual capacity of 15,000 tons, including alloys.

The open hearth is located in Piedras Negras and is operated largely on West Texas scrap, prepared at Eagle Pass, Tex., directly across the border, although occasionally pig iron from the Monterrey company is used. The two electric furnaces are located in Peralvillo, where the company is said to have the only steel foundry in Mexico. All of the open-hearth steel is shipped to that point for rolling.

"Never Borrowed"

The company rolls reinforcing bars, light shapes, wire rods and certain other steel products. It produces bolts, nuts and welding rods and is the exclusive agent in Mexico for the Lincoln Electric Co., Cleveland. It also has the only copper wiredrawing plant in that country and has facilities for producing brass and white metals. All of these facilities are at Peralvillo, where the company occupies a 16½-acre site and employs 1500 persons. At Piedras Negras the company has, in addition to its steelmaking facilities, an oxygen plant.

The company was founded in 1912 and has operated under at least seven names, and during all this time, it is said, has never had an annual deficit, never borrowed money, or laid off a worker. The open hearth was erected in 1937 and, except for repairs, has been operated continuously, three shifts, seven days a week. Last year the company's sales were said to have amounted to about $4,000,000.

The company's notable performance in keeping in the "black" is attributed in part to high tariff walls, the pacing of production to demand and to the fact that its products have been light materials, whereas the other Mexico steel company's output has been mainly the heavier products, such as pig iron, shapes and heavy rails.

The present announcement follows closely word that a large new steel plant will be erected in Monclova, Mexico, 130 miles across the border from Laredo, Tex., principally with the aid of American Export-Import Bank financing. This plant will be operated by Armco International Corp., export subsidiary of American Rolling Mill Co., Middletown, O.

It is understood the Monclova development will include a blast furnace, using ore from the Monterrey properties, and a plate mill, the only one in Mexico. Its finished steel output will be principally, if not entirely, flat-rolled products. Finished steel will not be competitive with that of either La Consolidada or Monterrey companies.

"Otis Steel" Name To Be Perpetuated by J & L

Name of Otis Steel will be preserved by Jones & Laughlin Steel Corp. which recently bought the assets of the Cleveland company. An Otis Steel Co. has been incorporated in Ohio with 250 shares of no par common stock, with H. E. Lewis, president, and W. J. Creighton and C. L. Austin, executives of J. & L., as incorporators.

Otis Steel has been a famous name in the steel industry in this country and in Great Britain since 1873.

Edward B. Greene, president, Cleveland Cliffs Iron Co., Cleveland, and E. J. Kulas, president of the former Otis Steel Co., have been elected directors of Jones & Laughlin. They replace James C. Watson and W. L. Copeland on the J. & L. board. Mr. Greene was a director of Otis Steel.

St. Louis Manufacturers In Co-Operative Group

A production advisory committee with 16 members was appointed recently in the St. Louis Ordnance district to assist manufacturers with war *materiel* contracts. The group is part of a nation-wide system of industry committees organized under the supervision of Maj. Gen. Levin H. Campbell, chief of ordnance, services of supply, to obtain maximum production in minimum time. Members are:

Lt. Col. E. H. Sager, head of the Ordnance Manufacturing Service; Lt. H. W. Hempel, contact officer; Cal Stephens, Robert R. Stephens Machinery Co. Inc.; G. Eichelsbach Jr., American Stove Co.; Ernest Dunford, Landis Machine Co.; Jonathon Kludt, Lincoln Engineering Co.; E. H. Nieman, Carter Carburetor Co.; Morley Langford, Sunnen Products Co.; Arthur Neutzel, Blackman-Neutzel Machine Co.; R. Laffler, Pratt & Whitney Co.; Hal Knight, W. B. Knight Machinery Co.; Henry Miller, Emerson Electric Mfg. Co.; F. G. Sachleben, Emerson Electric Mfg. Co.; O. W. Johanning, Colcord-Wright Co., and E. C. Meinholtz, Missouri Pacific railroad.

13 Steel Founders Named to OPA Committee

Price Administrator Henderson has invited 13 steel castings men to become members of an advisory committee which will serve as a liaison unit between the OPA and steel casting manufacturers on problems with respect to prices.

The group will be known as the Steel Castings Advisory Committee.

Those who were invited: N. K. Anderson, general manager, Alloy Steel & Metals Co., Los Angeles; E. E. Burke, general manager, Otis Elevator Steel Castings Division, Otis Elevator Co., Buffalo; Herbert Farrell Jr., president, Farrell-Cheek Steel Co., Sandusky, O.; M. A. Fladoes, president, Sivyer Steel Castings Co., Milwaukee; C. L. Harrell, vice president, Sterling Steel Casting Co., East St. Louis, Ill.; T. H. Harvey, vice president, Ohio Steel Foundry Co., Lima, O.; C. W. Howat, general manager, Continental Roll & Steel Foundry Co., Pittsburgh; Oliver E. Mount, secretary-treasurer, American Steel Foundries, Chicago; F. M. Robbins, president, Ross-Meehan Foundries, Chattanooga, Tenn.; J. A. Sauer, vice president, Symington-Gould Corp., New York; Thomas H. Shartle, president, Texas Electric Steel Casting Co., Houston, Tex.; Clarence Tolan Jr., president, Dodge Steel Co., Philadelphia; L. C. Wilson, general manager, Reading Steel Casting Division, American Chain & Cable Co., Inc., Reading, Pa.

Asks Reports on Idle Heat Treating Furnaces

Request that all idle heat treating equipment be reported to the Heat Treating Equipment Unit, War Production Board, Room 4520, Social Security Building, Washington, was issued last week. Request was made on behalf of the Aircraft Scheduling Unit, representing the air forces of the United States and Great Britain, and is designed to alleviate a bottleneck in furnace capacity for treating aircraft metals.

Bradley Stoughton is chief of the WPB Heat Treating Equipment Unit.

Activities of Steel Users and Makers

A "musical pep cocktail" greets workers at the lamp division, Westinghouse Electric & Mfg. Co., Bloomfield, N. J., as they assemble for the first shift at 7 a.m., and continues for 15 minutes. Five other half-hour periods of music are scheduled during the eight-hour shift, one at lunch time and the rest timed to coincide with periods of "let-down" or fatigue among workers. The broadcasting system was installed recently as part of a program arranged by the plant's WPB joint committee of labor and management.

♦

Armour Research Foundation, Chicago, has established a new analytical research laboratory to take over all chemical and spectroscopic analysis work in response to demand from war industries. The foundation engages in research for numerous industrial companies throughout the country. Only work requiring special accuracy or equipment will be undertaken.

♦

E. C. Atkins & Co., Indianapolis, recently honored three of its employes with the Atkins Merit Award for outstanding service to the company and to fellow workers. W. R. Chapin, Frank McCartney and C. A. Newport were the recipients. Mr. Chapin had, at an earlier date, received the Albert Saveur Award of the American Society for Metals for improvements in heat treating methods and a citation by the American Inventors Society for his work in developing steel cement.

♦

"James Mapes Dodge Day" was celebrated June 30 at Link-Belt Co.'s Nicetown, Philadelphia, plant as a memorial for the late James M. Dodge, a founder and former chairman of the board who died in 1915. Ceremony was attended by directors, officials and a number of employes to witness the unveiling of a portrait of Mr. Dodge, a gift to the company by his widow.

♦

Plomb Tool Co., Los Angeles, has organized facilities of 27 companies into a subcontracting system for volume tool production under the name of Plomb Tools Contracting Co., a wholly owned subsidiary of Plomb Tool, to meet war demands for special hand tools as well as regular types. Victor Kingman is president of the new company.

♦

The contribution which General Motors Corp. is making in production of armament and other war goods in its 90 plants throughout the country has been incorporated in a new sound motion picture "'America Can Take It." A special showing of the film was made in Chicago, July 1, to members of the General Motors Club of Chicago, composed of executives of the corporation and its subsidiaries, and invited guests.

♦

Seamlex Co. Inc. has moved to new quarters at 27-27 Jackson avenue, Long Island City, N. Y.

♦

New York office of H. M. Harper Co. has been moved to the Dodge building, 45 West Broadway. Earle A. Channer is manager.

♦

Reynolds Machinery Co., Cleveland, has opened an office in Columbus, O., to cover section of Ohio immediately surrounding Columbus, with W. V. Terry in charge. The company also has branch offices in Akron and Toledo, O.

♦

Hamilton Foundry & Machine Co., Hamilton, O., has been awarded the "10 per cent of payroll" certificate by the United States Treasury Department. This is in recognition of war bond purchasing by employes to the extent of 10 per cent of the total payroll. Average per worker is $5.14 per week deducted from wages to apply on bond purchases.

♦

Delivery of railroad locomotives in May totaled 111, compared with 132 in April and 87 in May, 1941, according to the Bureau of the Census. Total deliveries for five months were 557 units, against 351 for the same period in 1941 and 204 for five months in 1940. Unfilled orders at the end of May included 1586 units.

♦

International Business Machines Corp.'s employe training school at Endicott, N. Y., started the summer session recently with an all-time high record enrollment of 1368 students, company announced. New feature is a 5 a.m. class for the night shift. Blueprint reading and measuring instruments are the most popular of the ten-week courses. One-fourth of the student body is composed of women.

♦

Substitution of fibre pipe supported by concrete for steel oil well casing has been made in an Illinois well, according to Fibre Conduit Co., Orangeburg, N. Y. Company has received a report from the Dinsmoor Oil Co. that the well is operating in normal condition and the substitution apparently is satisfactory.

Fibre Conduit estimates that the substitution of fibre pipe for steel would save 75,000 tons of the latter metal this year if drillings continue at the 1942 rate. Should drilling reach the 1941 rate, the company says, the savings would amount to 150,000 tons annually.

Critical Machine Tools Found Idle in Midwest

Cutting across the war effort, 443,000 hours of idleness on critical machine tools in Ohio, Kentucky, West Virginia and western Pennsylvania have been reported to John C. Virden, regional director, War Production Board, by C. J. Perrier, chief of the Critical Tool Section.

The figure is expected to reach 600,000 hours upon completion of the search of unused or partially-used critical machines.

This area ranks so high in its concentration of critical tools its output alone, it is stated, could win a large war.

The Critical Tool Section's field force has surveyed 57 per cent of the 2232 companies in the region which own critical tools.

Recently 72 companies reported 90,000 hours of work they wished to place and 48 factories with idle machine hours took 51,000 hours of that time.

Publication of ABMS Reports Prohibited

Pursuant to the Censorship Code and at request of the Office of Censorship, all reports issued by the American Bureau of Metal Statistics henceforth will be stamped "Confidential — Not for Publication."

If the new ruling is violated and figures are published, these reports may have to be discontinued entirely.

Reports issued by the American Bureau of Metal Statistics include those on production, consumption and stocks of copper, lead, zinc, tin, aluminum, platinum, arsenic, antimony, cobalt, cadmium, etc. The government suppressed last year the publication of all import and export statistics and has steadily increased its prohibitions on publication of various other data.

$20,000,000 Aircraft Parts Plant Authorized

Cleveland Pneumatic Tool Co., Cleveland, through its war subsidiary, Cleveland Pneumatic Aerol Inc., will operate a $20,000,000 aircraft parts plant to be financed by the government, in Euclid, Cleveland suburb.

Construction of the plant will be started as soon as possible, according to spokesmen for Defense Plant Corp. Sponsored by the Navy, the factory is expected to be completed early in 1943.

Air Raid Defense Organization Set Up by U. S. Steel

PREPARATIONS which operating subsidaries of the United States Steel Corp. are making to guard against sabotage and air attacks are described in the July issue of the *USSteel News*.

The corporation points out that even middlewestern industrial plants — in Chicago or Pittsburgh—are susceptible to enemy air raids from carriers off the Atlantic coast, or from temporary bases which might be established on Greenland, in the Hudson Bay area and similar territory.

To cope with such possible enemy action the corporation's subsidiaries are organizing and training employes for plant defense and protection.

In Carnegie-Illinois Steel Corp., the largest of the subsidiaries, 18,000 of a total of 125,000 employes are being given supervised training under the direction of Bennett S. Chapple Jr., assistant to the vice president in charge of emergency defense co-ordination. It is Mr. Chapple's responsibility also to coordinate the plant organization with public authorities and civilian defense agences.

Training of employes in methods of plant defense is being conducted by the industrial relations department in Pittsburgh, and the training staffs within each plant. This training is based on a series of manuals covering each of the essential emergency functions, and is designed so that each trainee will know how to deal with particular industrial hazards.

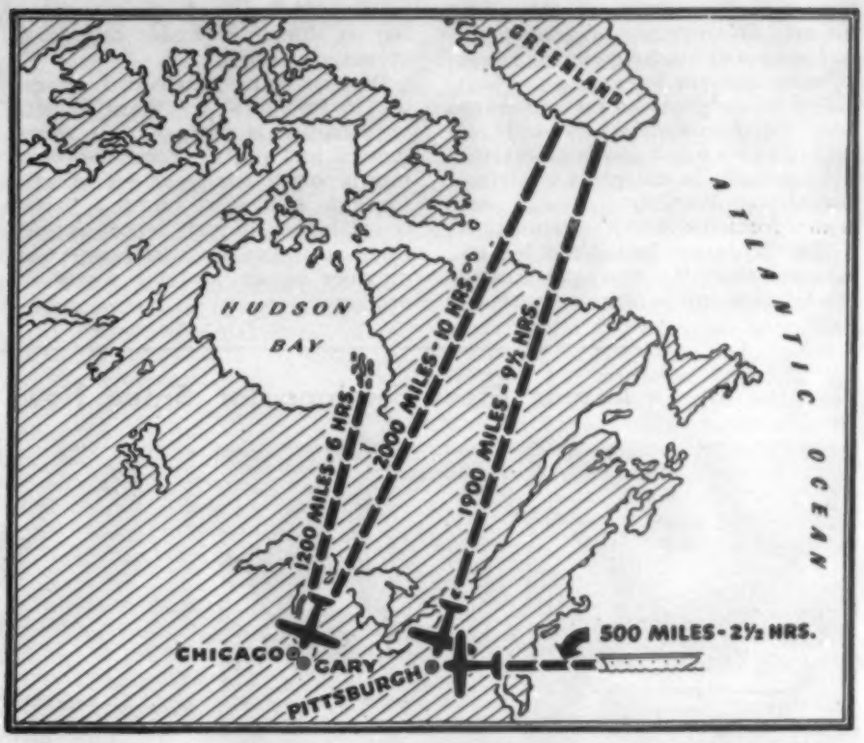
Training program, like that for civilian defense which it resembles in its broad outline, provides separate intensive instructions for specific emergency functions.

A supplementary device used in the training program is a sound-slide film entitled, "It Can Happen Here," illustrating the danger of enemy attacks and the measures that may be taken to cope with them. The film was prepared by the training division staff especially to aid in the more general training of employes whose services are not needed for special emergency duties.

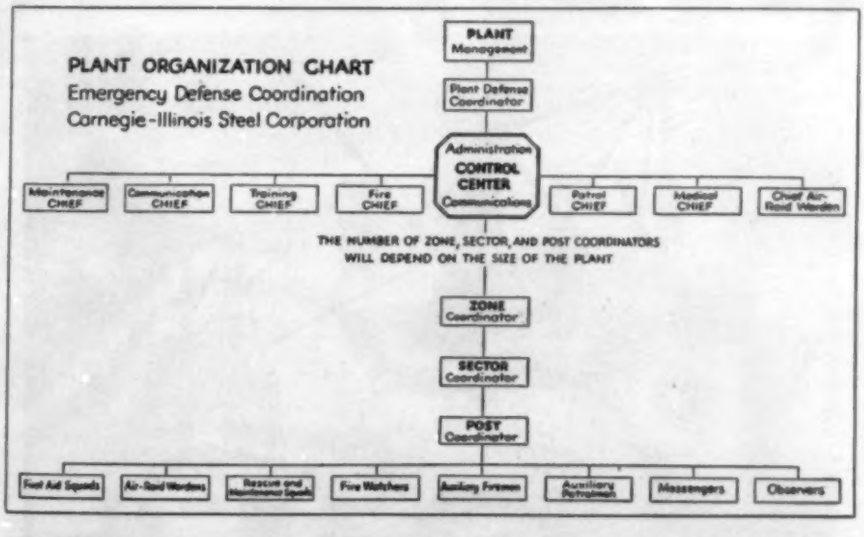
Accompanying chart shows the defense organization in a typical Carnegie-Illinois plant. Top responsibility rests with the general superintendent, who may delegate the authority to a plant defense co-ordinator, charged with full responsibility for the organization and functioning of the defense activities.

Reporting directly to the plant defense co-ordinator are the chiefs of seven service groups: Maintenance, communications, training, fire, patrol, medical and chief air raid warden.

Assignments involving the maintenance, training, fire patrol and medical posts logically fall upon the person in charge of those duties in the regular organization. The patrol chief, for example, continues to have the responsibility of patroling buildings and grounds, checking individuals in and out of the plant, and enforcing the rules and regulations. In addition, he must



U. S. STEEL'S chart indicates how plants located at such inland centers as Pittsburgh and Chicago might be bombed. Enemy carriers off the Atlantic coast could approach within 500 miles or 2½ hours flight time from Pittsburgh. Temporary bases possibly could be established on the west coast of Greenland where land-based planes would have only 1900-mile flight to Pittsburgh. 2000 miles to Chicago. Or the enemy might penetrate the Hudson Bay region and come within 1200 miles of Chicago



TYPICAL defense organization in a Carnegie-Illinois Steel Corp. plant is shown above. Prime responsibility rests with the plant management but usually is delegated to a plant defense co-ordinator. Various employes are trained in specific emergency functions

keep his organization on the alert for acts of espionage and sabotage, and in case of blackouts or air raids, he must prevent looting.

Special assignments are necessary only for communications and air raid defense. Communications chief usually is the plant electrical engineer. Wardens usually are drawn from the safety organization.

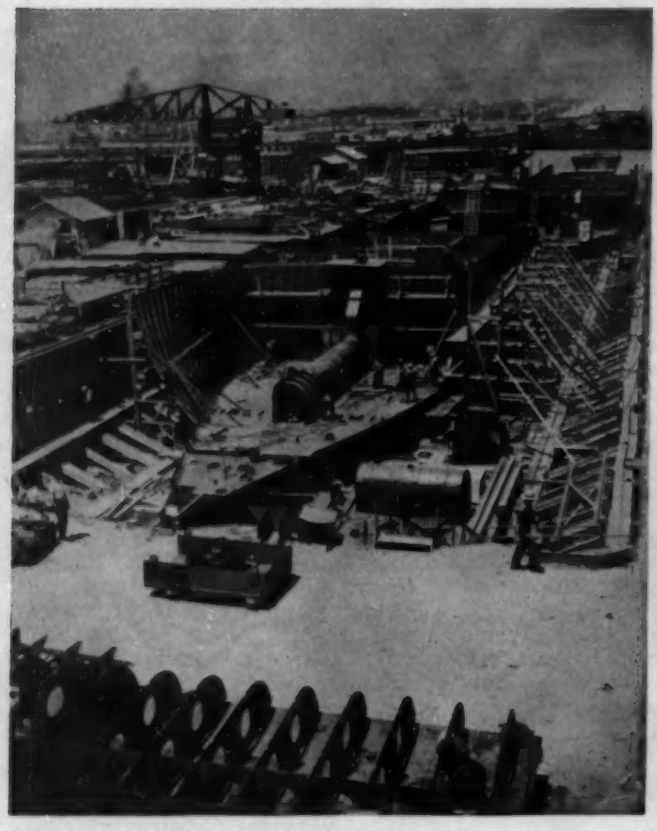
The chiefs are instructed for responsibilities in two categories: First, what preparations must be made before actual attack occurs; second, functions under the stress of actual attack.

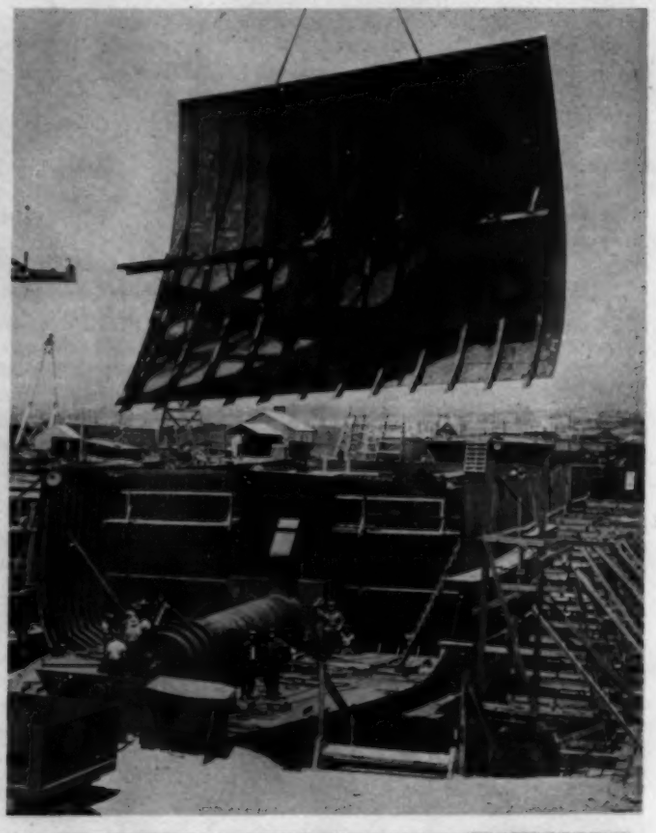
Besides being subdivided according to functions, the plant defense organization is arranged into zones, sectors and posts. Zone co-ordinators report to the plant co-ordinator through a control center. Sector co-ordinators, in turn, report to their zone co-ordinator, and post co-ordinators report to their sector co-ordinators.

Responsibilities of the zone, sector and post co-ordinators are carried by division superintendents, department superintendents and general foreman.

Reporting to each post co-ordinator are men chosen from among employes and trained in specific functions, such as first aid, air raid wardens, rescue and maintenance, fire watchers, auxiliary firemen, auxiliary patrolmen, messengers and observers.

Larger Steel Sections for Ships Now Prefabricated





THIS WAR has developed interesting trends in steel ship assembly methods. Larger sections are being prefabricated, as indicated by the photographs. At the right is a 36-ton stern section of a small naval vessel being built by Federal Shipbuilding & Dry Dock Co., Kearny, N. J. Upper right shows a side section, plates and ribs assembled, being lowered into place at Pacific Bridge Co.'s Alameda, Calif., yards.

Handling of these large sections is being facilitated in some instances by the use of dry docks especially built for complete ships. Compared with the standard type of graving dock, which customarily serves one ship at a time for repairs or fitting out, the shipbuilding dock is wider and shallower. Space is conserved; it is more convenient to weld sections on adjacent ground, and greater area permits easy operation of cranes. In the upper left photo two ships are being built in such docks at Alameda

Canadian Steelmaker Adds Capacity; May Production Sets New High Mark

TORONTO, ONT.

DOMINION STEEL & COAL CORP. LTD. is spending $3,000,000 to $5,000,000 in an expansion program at its Sydney, N. S., plant which will increase its steelmaking capacity to 675,000 tons and pig iron to 600,000 tons per year. At the beginning of the war capacity was 400,000 tons of steel and 438,000 tons of pig iron.

An additional blast furnace will be provided by moving the shell of a furnace from Ojibway, Ont., plant which was purchased some time ago from United States Steel Corp. With four stacks the company will be able to provide sufficient pig iron for use of 70 per cent iron and 30 per cent scrap in the open-hearth department, thus relieving the scrap situation partially.

An open hearth with 75,000 tons annual capacity will be built soon. New buildings and additions and rolling mill equipment will represent about $200,000.

Canadian production of steel and pig iron in May established new records for monthly output. With ingot and castings production 272,247 net tons, compared with 264.988 tons in April, the daily rate in May was slightly under that of April, 8782 tons against 8833 tons in April.

Pig iron production in May exceeded all prior records as a result of blowing in of a new stack at Port Colborne, the daily rate rising from 5347 tons in April to 5528 tons in May. At the end of May pig iron output was at 94 per cent of capacity, 11 out of 12 stacks being in operation. The idle furnace, which has not been in blast for several years, is undergoing repairs. Steel production is at approximately 99 per cent.

Comparisons are shown in the following table, in net tons:

	Steel ingots, castings	Pig iron	Ferro-alloys
May, 1942 ...	272,247	171,386	19,428
April, 1942 ..	264,988	160,408	18,128
May, 1941 ...	230,843	127,259	16,931
5 mos., 1942 ..	1,305,075	806,039	93,179
5 mos., 1941 ..	1,076,624	574,827	81,963
5 mos., 1940 ..	807,875	470,190	49,079

Canada has adopted the Production Requirements Plan of the United States, using similar numbers and symbols to indicate end-use of steel products. Customers have been given instructions similar to those in effect in the United States.

Census of all used industrial, construction and road maintenance machinery is under way in Canada and will be completed by the end of July, it is announced by H. H. Bloom, administrator of farm and road machinery and municipal services. The administrator is given power to require the owner to sell or rent equipment which is idle or in use on non-essential work. This will make it available to essential use where needed.

Controller of supplies has prohibited installation, except by permit, of air-conditioning equipment and commercial refrigeration. Purchase or use of copper tubing has been prohibited except by permit. An order has been issued making it illegal to sell or deliver, except on written permission, any new electrical supplies other than for replacements. The replaced parts must be surrendered as proof.

C. D. Howe, minister of munitions and supply, has issued a warning that many manufacturers will be unable to obtain sufficient raw materials to keep their plants operating, because of the critical supply situation. Manufacturers of civilian articles will be supplied only after all war needs have been satisfied.

The first metallic magnesium plant in Canada is scheduled to start operations soon, using a process to be employed also in new plants in the United States. The magnesium is produced at unusually low temperatures by retort, using ferrosilicon in a direct reduction process.

A new process for extracting aluminum from substitute ores is being developed in Canada, from experiments in progress since the outbreak of the war, seeking substitutes for imported bauxite. A deposit is stated to have been discovered from which aluminum can be obtained in the event of a serious interruption of imported supplies.

Recovery of scheelite is to be undertaken by the Hollinger Consolidated Gold Mining Co. at Timmons, Ont., where a $50,000 mill has been built. The mineral is found widely distributed in Ontario and the Northwest Territory in small quantities which have not justified mining for tungsten alone. With increased demand for tungsten and a mill for treatment of scheelite, working of the scattered deposits will be justified. Actual refining of the product will be done by a small plant operated at Ottawa, Ont., by the Dominion Bureau of Mines.

Anglo-American Production Board Established; Nelson To Visit London

WASHINGTON

WPB Chairman Donald M. Nelson will go to England next month for a series of conferences on the co-ordination of American-British war production, it was said last week. He will inspect Britain's production machinery, inquire about the island's problems, and continue conversations started last month with Oliver Lyttelton, British Minister of Production, in Washington.

During the interim, Mr. Nelson and Mr. Lyttelton will complete organization of the Combined Anglo-American Production and Resources Board, established while Mr. Lyttelton was in this country.

Mr. Nelson has appointed James S. Knowlson, WPB Director of Industry Operations, as his deputy on the board. Mr. Lyttelton has named Sir Robert J. Sinclair, director general of army requirements in the British War Office, as his chief assistant.

The WPB chieftain also announced that W. Averill Harriman, lend-lease co-ordinator, and Philip D. Reed, WPB chief of the Bureau of Industry Branches, have been appointed his representatives in London.

Conferences between Mr. Nelson and Mr. Lyttelton are expected to center on the relationship between production and shipping. For example, fighter planes are difficult to transport across the Atlantic and their output probably will be concentrated in Great Britain. Bombers, in contrast, easily can be flown across the ocean and the United States probably will be the center of production for these.

In many other ways it is hoped to ease the pressure on shipping occasioned by the unhalted submarine sinkings of United Nations' ships and the peril of transAtlantic voyages.

Establishment of joint boards, for production, purchasing, conservation of raw materials and for strategy, is expected in Washington to have a great effect on post-war relations between Great Britain, the United States and probably other members of the United Nations. A co-operative economy may replace the autonomous competitive economy that existed before the war, it is said.

LABOR

Sunset, Night and Dawn Shifts For 'Round-the-Clock Production

Management's problem of retarded productiveness of workers employed in 'round-the-clock operation and adjustment of shifts for greater efficiency is the subject of a pamphlet prepared by Dr. Nathaniel Kleitman of the University of Chicago and published by the United States Department of Labor.

The most difficult problem in multiple shift operations is said to be in the night turn, or "graveyard" shift. Accidents increase and production declines because the lowest levels of body temperature and vitality are reached in the early morning hours—2 to 5 o'clock. This is attributed more to lifetime habit of day work and night sleep than to any fixed cycle of bodily activity.

Each time his shift is changed, a worker takes several weeks to reestablish himself in a new sleep-work-meals routine. To overcome ill effects, it is suggested that each worker be kept on a shift for an extended period, several months instead of weeks or days. Specific examples of shift timing for best results in a plant running three 8-hour shifts are:

Sunset shift—working hours from noon to 8 p. m. Evening and early night free for leisure activities. Sleep from 1 or 2 to 9 or 10 a. m.

Night shift—working hours from 8 p. m. to 4 a. m. Sleep from 5 a. m. to 1 p. m. Afternoon and early evening free for leisure.

Dawn shift—working hours from 4 a. m. to noon. Leisure in afternoon. Sleep from about 7 p. m. to 3 a. m.

Advantages in such timing are said to be the relatively small displacement of customary sleeping hours and changes take place at other than community rush hours.

For industries unable to operate continuously, or those with two 10-hour shifts, it is recommended that they break them as follows: Early shift, from 4 or 5 a.m. to 2 or 3 p. m. Late shift, from 2 or 3 p. m. to midnight or 1 a. m.

Birth Certificates No Longer Required for War Jobs

Birth certificates to prove American citizenship for persons who want jobs in plants where work on secret confidential government contracts is being done will no longer be required, Paul V. McNutt, war manpower chairman has announced.

New procedure developed jointly by the Army and Navy, the War Manpower Commission, and the U. S. Employment Service calls for merely a simple declaration that the applicant for a job is a citizen. This declaration, however, must be signed by the worker in the presence of an Army or Navy District Procurement, factory or plant protection representative. War and Navy contractors and subcontractors have been notified of the new procedure, and the employment offices have been instructed to assist employers and workers in carrying it out.

Many valuable man-hours of production were being lost because of difficulties and delays in obtaining birth certificates. State Bureaus of Vital Statistics have been unable to keep up with the mounting number of requests, with the result that work on many urgent war contracts has been delayed.

New procedure does not relieve the employer from the duty of making further investigation when there is any reason to doubt the truth of the applicant's declaration that he is a citizen. On the other hand, workers signing such a declaration will be informed that the penalty for misrepresentation may be as much as $10,000 fine, or five years in prison, or both.

Union Financial Statement Proposal Rejected by WLB

Proposal by employer members of the War Labor Board to require unions to make public statements of finances was rejected by 8 to 4. Wayne L. Morse, dean of the University of Oregon law school and a public member of the board, charged the proposal was "highly improper" and an attempt to "legislate certain regulations upon unions which Congress refused to do".

The board granted a union maintenance contract to the Farm Equipment Workers Organization Committee-CIO at the plants of the Caterpillar Tractor Co., Peoria, Ill.

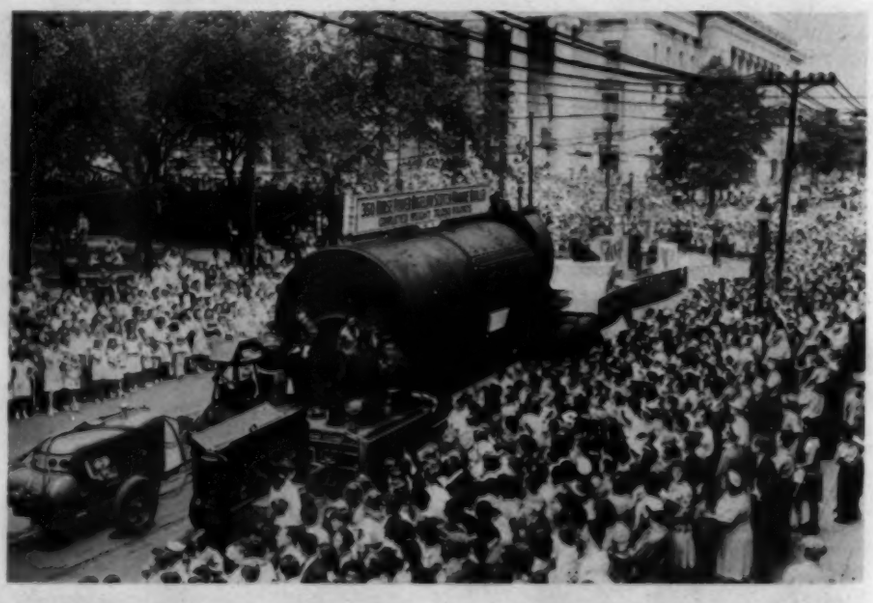
"Refusal To Obey Might Prejudice War Effort"

War Labor Board has ordered Phelps Dodge Corp., and several unions involved in two cases pending before it to include in agreements between them provisions for maintenance of membership, a flat increase of 50 cents per day retroactive to April 16, with a minimum of $4.90 per day, and a seven-day vacation with 48 hours straight-time pay. This applies to certain mines in Arizona.

Louis S. Cates, president, stated the corporation will comply with the order. Referring to the part relating to maintenance of membership, he added: "However, only because of its belief that a refusal to obey might prejudice the country's war effort."

"This corporation has always believed and still believes in the right of an employe to decide for himself not only whether he wishes to become a member of a labor union, but also whether he wishes to remain a member of a union. We adhere to that position," he declared.

Work Continues, Even on Parade



INDEPENDENCE Day was celebrated at New Haven, Conn., but essential war production did not stop. The men on this float participated in an "On to Victory" parade, but took their working equipment with them and continued construction of a marine boiler, which when completed will weigh 90,250 pounds. NEA photo

Employe-Suggestion Plans Analyzed; Started in Metal Plants 50 Years Ago

ENLISTING the best thoughts of employes to improve working conditions and plant operations through an employe suggestion system, in which payments are made for those found practicable, has been in effect in American industry for nearly half a century. National Cash Register Co. established such a system at Dayton, O., in 1894 and Eastman Kodak Co. in 1898 put in effect a similar plan at Rochester, N. Y.

National Industrial Conference Board, New York, has published a report of research into the experience of 132 companies as a guide to others which may desire to make use of the ideas of employes. Adoption of a suggestion system requires careful planning and execution, backed by knowledge of basic characteristics of plans found successful by other companies. Examination of plans that have failed and reasons for failure is also valuable. The report contains descriptions of 23 company plans, based on detailed information selected from suggestion manuals. Nearly half the plans analyzed have been in effect ten years or longer.

One company states its main object is to provide a formal assured avenue of employe expression rather than to obtain monetary savings. This company has found from systematic recording of employe opinion, that one of the most important desires of the average employe is to have his employer give careful consideration to his ideas regarding possible changes in operations and working conditions.

Plans Vary in Scope

Plans vary considerably in the scope of subjects that are considered eligible for consideration on an award basis. Some plans limit them to a specific list of subjects, while others receive any suggestion that benefits the company.

As means to eliminate the idea of favoritism a large proportion of the plans provides for the suggestions being considered by the award committee without knowledge of the identity of the employe submitting them.

In the great majority of systems the major incentive in obtaining constructive ideas for improvement of product, working conditions or manufacturing efficiency is a cash award. Other incentives, such as public recognition and increased responsibility, are sometimes considered sufficient inducement to obtain co-operation of rank and file employes, but the trend is toward financial incentives. On suggestions involving tangible benefits a large number of companies follow a strict rule of paying 10 per cent of net savings for first year, no matter how large the award. Others award from 3 to 30 per cent of savings, according to the ingenuity of the suggestion.

A frequent reason for abandoning such systems is failure to solve the problem of handling rejections. It needs to be done in a way to avoid discouraging the employe.

A large aircraft company recently adopted a formal policy on patentable suggestions by announcing a program for assisting employes in any effort they may wish to make in patenting or promoting ideas they have been working on outside the plant. Some companies have a written patent agreement covering suggestions which have patentable features.

A company which has achieved unusual success with its plan stresses the point that management must be thoroughly sincere in asking and offering to pay for suggestions. Other considerations developed in the research included: Get the wholehearted co-operation of the supervisory force; recognize supervisors' suggestions in some way; investigate each entry thoroughly; be sure that decisions are absolutely impartial; pay fair awards and err on the side of liberality; publicize problems on which management is thinking and ask for ideas; explain how awards are determined; follow up adopted suggestions and make sure they are put into effect.

A large company expresses its policy as follows: "No one man, no small group of men, can possibly know enough about all the details of any business to bring about ideal conditions. We need the active interest and brain-power and the suggestions of everyone connected with the organization in any capacity."

Shortage of Labor in 138 Essential War Occupations Listed by WMC

List of 138 occupations essential to the war effort in which there is a national shortage of labor was announced last week by the War

Workers Rewarded for Production Suggestions

"VICTORY WORKERS" at Ohio Crankshaft Co., Cleveland, were congratulated recently by Col. A. Robert Ginsburgh, special representative of Under Secretary of War R. P. Patterson, and William C. Dunn, company president. The employes received cash awards for suggestions they had made in the labor-management "production-plus" drive. They were cheered by 1000 who attended a patriotic open air assembly addressed by Colonel Ginsburgh (center, in uniform)

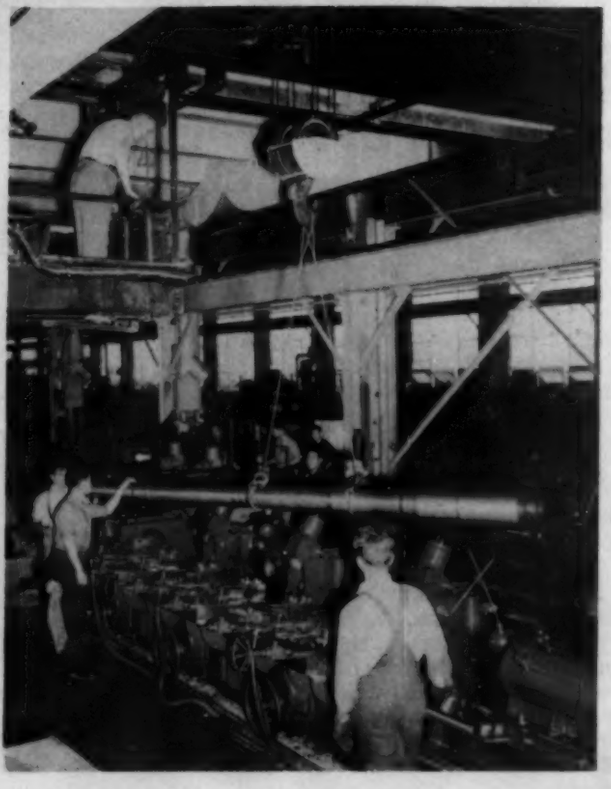
Manpower Commission. The list was compiled by the United States Employment Service which was directed by the commission to make the survey. It is based upon hiring schedules of 11,000 major war industry plants.

Most serious labor shortages are in the vital metalworking and industrial machinery trades, and in occupations essential to shipbuilding, aircraft, tool and ordnance manufacture. For every available ship and boatbuilding assembler, 94 are needed, and for every available toolmaker, 31 are needed.

Other occupations in which extreme shortages exist are:

	Ratio of Demand to Supply
Plate hanger (shipbuilding)	62 to 1
Skin man (aircraft)	48 to 1
Crane rigger	22 to 1
Boring mill operator	16 to 1
Internal-grinder operator	15 to 1
Tool designer	15 to 1
Diemaker	14 to 1
Skeleton assembler (aircraft)	14 to 1
Metal chipper (shipbuilding)	11 to 1
Finish boat painter	10 to 1

Nearly 875,000 workers are scheduled to be hired through August by the 11,000 employers whose labor needs were surveyed by the United States Employment Service. Where workers in the critical shortage occupations are called for, employers will have to make adjustments. Greater efforts to up grade their present employes and simplify the jobs, wherever possible, will enable them to use less skilled workers and those in related occupations who can be trained in a relatively short time. He urged employers to make the most effective possible use of the skilled labor they now have in their plants, and to expand on-the-job training programs so that necessary war production would not be hampered.



◆

Ack-Ack Gun Barrels Machined On Multi-Tooled Lathes

MACHINING antiaircraft guns in an eastern arsenal. Upper photo, rough turned 90 mm. barrels, as delivered to the arsenal. Center picture shows how finish step-machining of outside of barrels has been speeded up through use of multi-tooled lathe designed for two-man operation. Lower view shows the lathe with its pneumatically operated tail center and steady-rests withdrawn to permit crane to lift out machined barrel. Note in center photo that bin is placed right behind machine to insure immediate segregation of valuable gun steel chips. NEA photos released by U. S. Army censors

◆

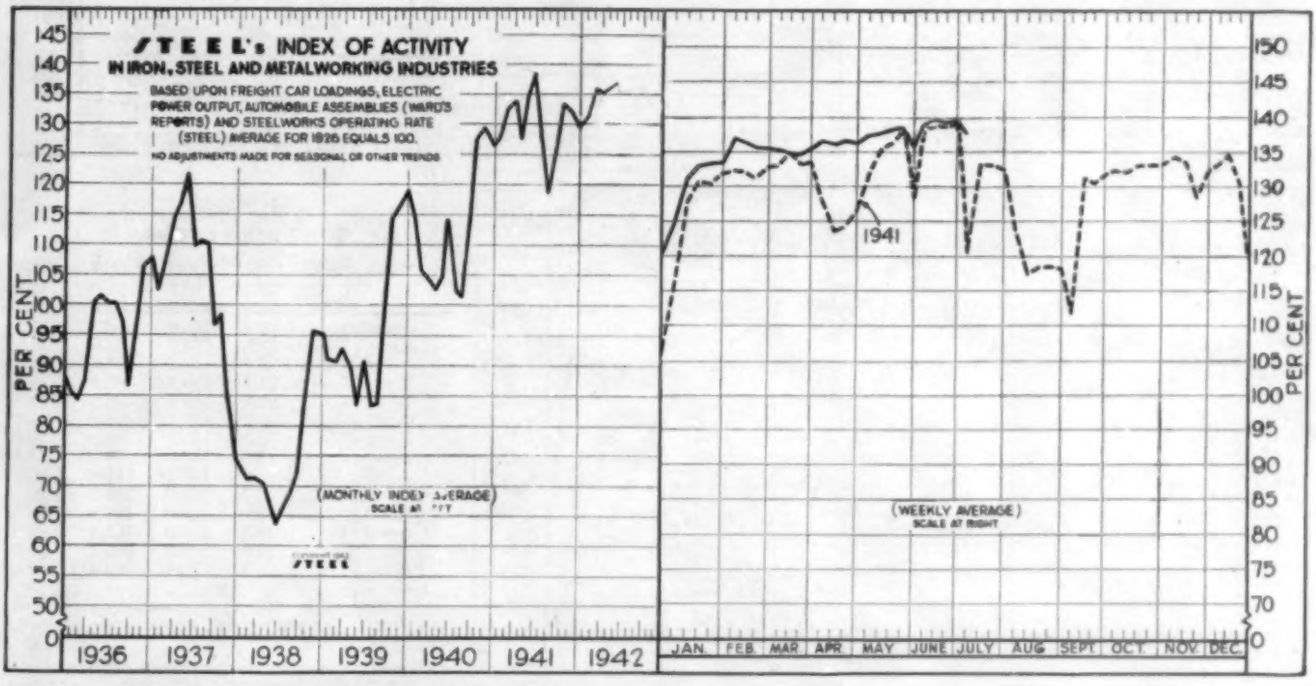
Activity Index Declines During Holiday Week

REFLECTING the all-out effort to increase output of military goods, industrial activity declined only slightly during the Fourth of July holiday week. STEEL's index eased 2.1 points in that period to 137.6, while in the same week last year it declined 17.9 points to 120.9. During the like weeks of 1940, 1937 and 1929 the index receded 21.1, 11.5 and 12.2 points respectively.

The national steel rate was off only 1 point to 97.5 per cent in the week ended July 4, compared with a decline of 7.5 points to 92 per cent in the same period a year ago. The scrap situation is preventing capacity operations at some centers. In almost every instance steel production is absorbing all scrap tonnage arriving at mills' yards. This situation leads some steel producers to predict that ingot operations late this fall and winter may be curtailed because of adverse weather conditions holding up collections.

Revenue freight carloadings declined 60,000 cars during the holiday week, to about 615,000. In the like week a year ago freight traffic was off 168,171 cars to 740,493. Volume of freight moved by the major railroads during the first quarter this year was 20.4 per cent above the comparable 1941 period tonnage. However, total carloadings in the quarter ended March 31 last were up only 6.7 per cent. Heavier loading and longer haul of railroad cars account for the spread in the percentage increases.

Electric power consumption receded less than usual during the Fourth of July week to 3,424,188,000 kilowatts. Compared with a year ago power output is up 17.9 per cent.

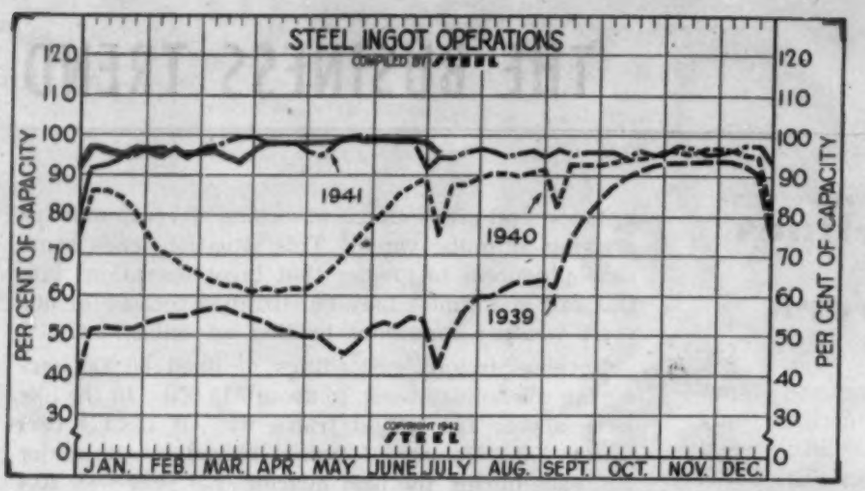


STEEL's index of activity declined 2.1 points to 137.6 in the week ending July 4:

Week Ended	1942	1941
May 2	137.2	132.6
May 9	137.5	135.9
May 16	137.9	136.1
May 23	138.1	138.6
May 30	136.0	128.4
June 6	138.4	138.4
June 13	139.5	138.7
June 20	139.3	138.7
June 27	139.7	138.8
July 4	137.6†	120.9

†Preliminary.

Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Jan.	131.3	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1
Feb.	136.3	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5
March	135.2	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
April	136.6	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
May	137.4	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
June	139.2	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
July	.....	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
Aug.	.....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Sept.	.....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Oct.	.....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
Nov.	.....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
Dec.	.....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3



Steel Ingot Operations

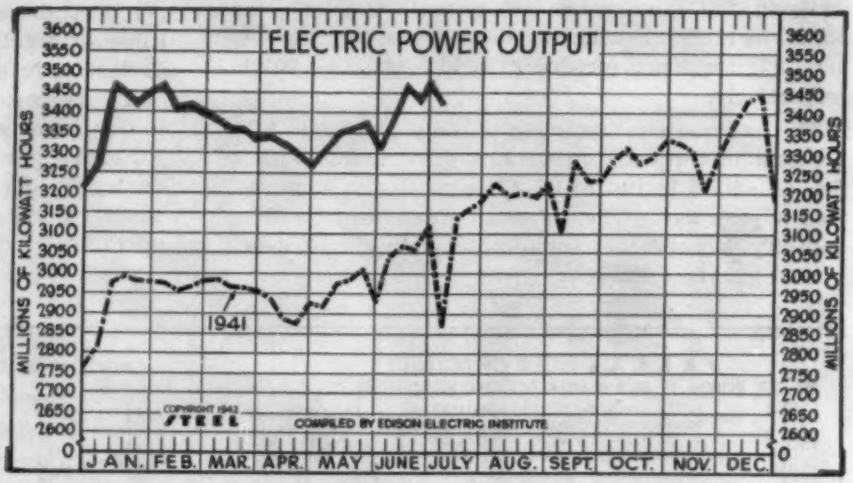
(Per Cent)

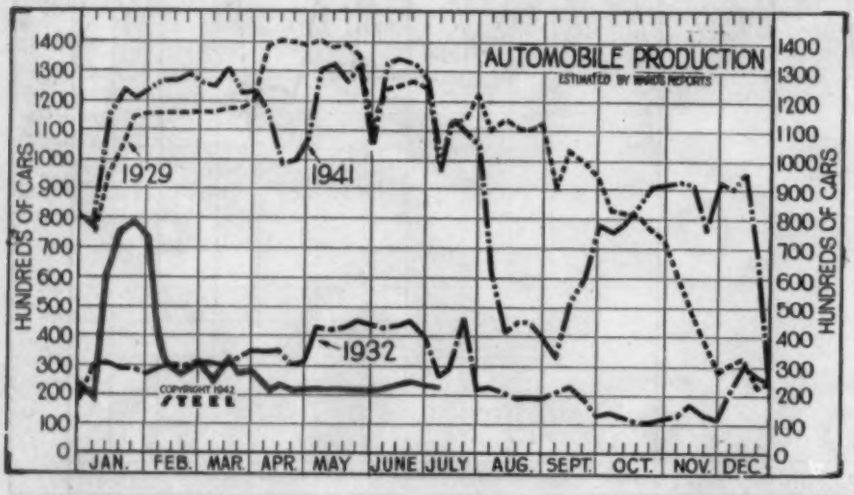
Week ended	1942	1941	1940	1939
July 4....	97.5	92.0	75.0	42.0
June 27....	98.5	99.5	89.0	54.0
June 20....	99.0	99.0	88.0	54.5
June 13....	99.0	99.0	86.0	52.5
June 6....	99.0	99.0	81.5	53.5
May 30....	99.0	99.0	78.5	52.0
May 23....	99.0	100.0	75.0	48.0
May 16....	99.5	99.5	70.0	45.5
May 9....	99.0	97.5	66.5	47.0
May 2....	99.0	95.0	63.5	49.0
April 25...	98.5	96.0	61.5	49.0
April 18...	98.5	98.0	61.5	50.5
April 11...	98.5	98.0	61.0	51.5
April 4....	98.0	98.0	61.5	53.5
Mar. 28....	97.5	99.5	61.0	54.5
Mar. 21....	95.5	99.5	62.5	55.5
Mar. 14....	95.5	98.5	62.5	56.5

Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
July 4.....	3,424	2,867	2,425	2,145
June 27.....	3,457	3,121	2,660	2,396
June 20.....	3,434	3,056	2,654	2,382
June 13.....	3,464	3,066	2,665	2,341
June 6.....	3,372	3,042	2,599	2,329
May 30.....	3,323	2,924	2,478	2,186
May 23.....	3,380	3,012	2,589	2,778
May 16.....	3,357	2,983	2,550	2,235
May 9.....	3,351	2,975	2,516	2,239
May 2.....	3,305	2,915	2,504	2,225
April 25.....	3,299	2,926	2,499	2,244
April 18.....	3,308	2,874	2,529	2,265
April 11.....	3,321	2,882	2,530	2,235
April 4	3,349	2,938	2,494	2,244
Mar. 28.....	3,346	2,956	2,524	2,272
Mar. 21.....	3,357	2,964	2,508	2,258
Mar. 14.....	3,357	2,965	2,550	2,276
Mar. 7.....	3,392	2,987	2,553	2,285


ELECTRIC POWER OUTPUT
MILLIONS OF KILOWATT HOURS
1941
COPYRIGHT 1942 STEEL
COMPILED BY EDISON ELECTRIC INSTITUTE
J A N. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.



Auto Production

(1000 Units)

Week ended	1942	1941	1940	1939
July 4....	22.7	96.5	52.0	42.8
June 27....	22.9	127.9	87.6	70.7
June 20....	23.2	133.6	90.1	81.1
June 13....	22.3	134.7	93.6	78.3
June 6....	22.0	133.6	95.6	65.3
May 30....	21.5	106.4	61.3	32.4
May 23....	21.6	133.6	96.8	67.7
May 16....	21.8	127.3	99.0	80.1
May 9....	21.5	132.6	98.5	72.4
May 2....	22.0	130.6	99.3	71.4
April 25...	21.9	108.2	101.4	86.6
April 18...	21.7	99.9	103.7	90.3
April 11...	23.0	99.3	101.9	88.1
April 4....	22.3	116.3	101.7	87.0
Mar. 28....	28.9	124.2	103.4	86.0
Mar. 21....	28.9	123.8	103.4	89.4

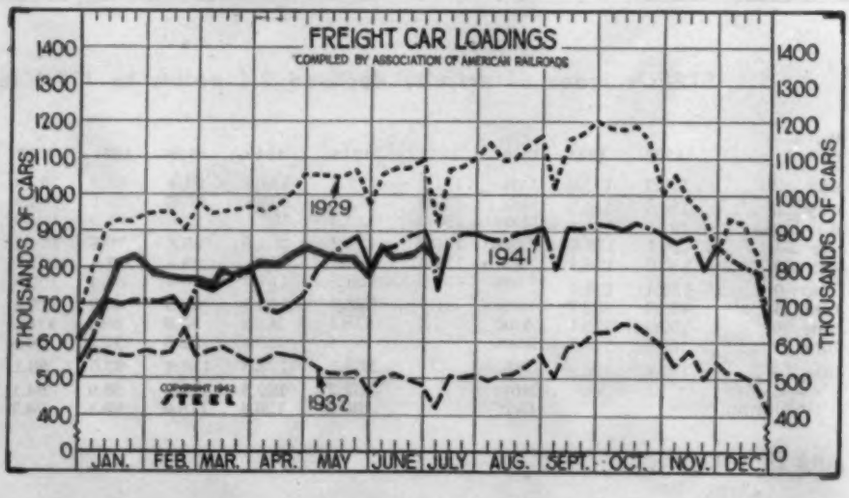
†Canadian trucks and automobiles and United States trucks, since week of Feb. 21 last.

Freight Car Loadings

(1000 Cars)

Week ended	1942	1941	1940	1939
July 4.....	815†	741	637	559
June 27.....	853	909	752	664
June 20.....	840	886	728	643
June 13.....	833	863	712	638
June 6.....	855	853	703	635
May 30.....	796	802	639	568
May 23.....	838	866	687	628
May 16.....	839	861	679	616
May 9	839	837	681	555
May 2.....	859	794	666	573
April 25.....	855	722	645	586
April 18.....	847	709	628	559
April 11.....	814	680	619	548
April 4.....	829	683	603	535
Mar. 28.....	805	792	628	604

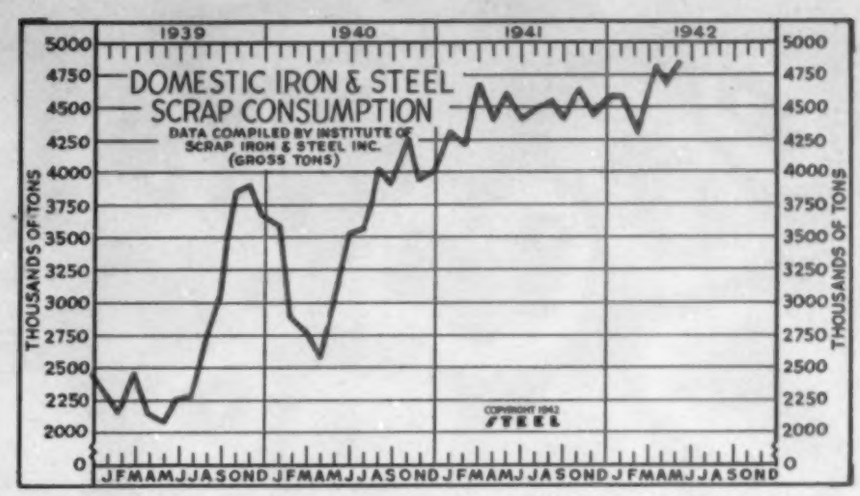
†Preliminary.

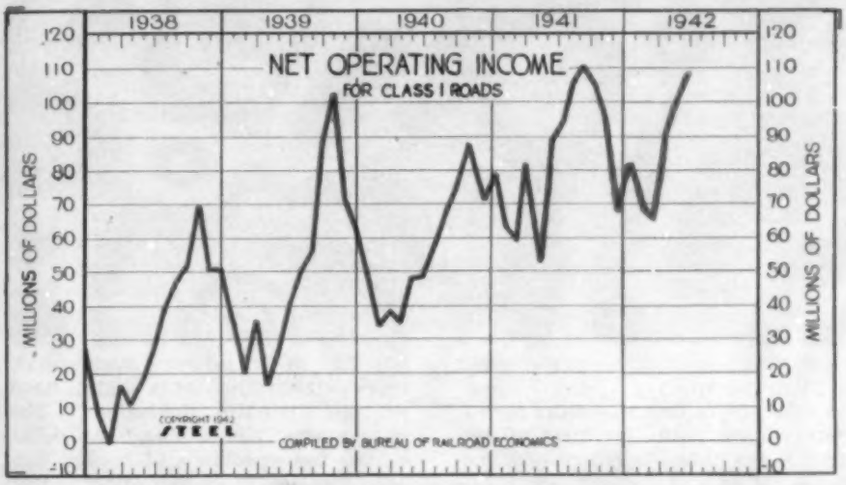


Iron and Steel Scrap Consumption

(Gross Tons)

	1942	1941	1940	1939
		(000 omitted)		
Jan.	4,590	4,278	3,581	2,257
Feb.	4,276	4,172	2,812	2,124
Mar.	4,840	4,662	2,728	2,419
Apr.	4,672	4,406	2,548	2,114
May	4,857	4,609	3,061	2,079
June	.....	4,406	3,482	2,221
July	.....	4,415	3,526	2,247
Aug.	.....	4,518	3,968	2,675
Sept.	.....	4,392	3,876	3,018
Oct.	.....	4,649	4,233	3,809
Nov.	.....	4,482	3,922	3,858
Dec.	.....	4,634	3,950	3,613
Total	.....	53,623	41,687	32,434
Mo. Av.	.....	.....	3,474	2,703





Class I Railroads Net Operating Income

(Unit: $1,000,000)

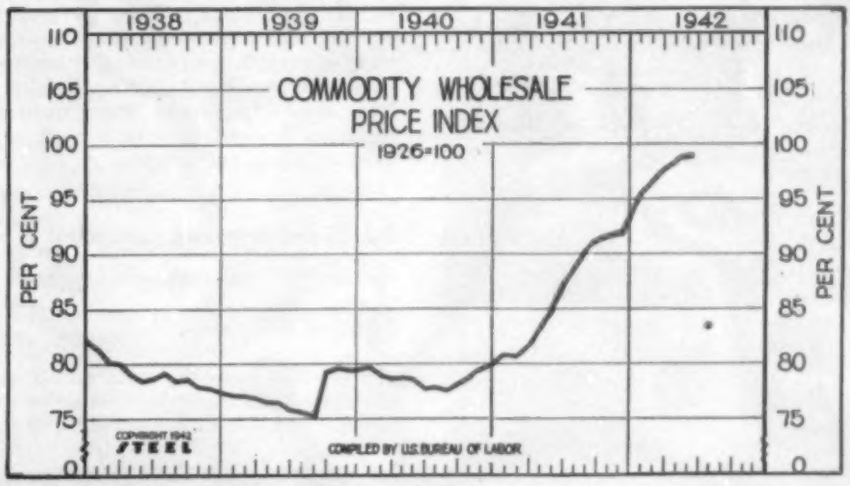
	1942	1941	1940	1939
Jan.	$68.97	$62.02	$46.01	$32.95
Feb.	66.49	58.48	32.86	18.64
Mar.	92.36	80.63	37.03	34.38
April	101.99	52.57	34.12	15.32
May	109.58	88.63	47.41	25.17
June	.....	93.26	48.09	39.17
July	.....	106.31	57.73	49.00
Aug.	.....	111.32	66.53	54.57
Sept.	.....	104.07	74.72	86.53
Oct.	.....	93.66	87.64	101.72
Nov.	.....	68.76	72.00	70.41
Dec.	.....	80.55	78.79	60.95
Average	.....	$83.29	$56.84	$49.02

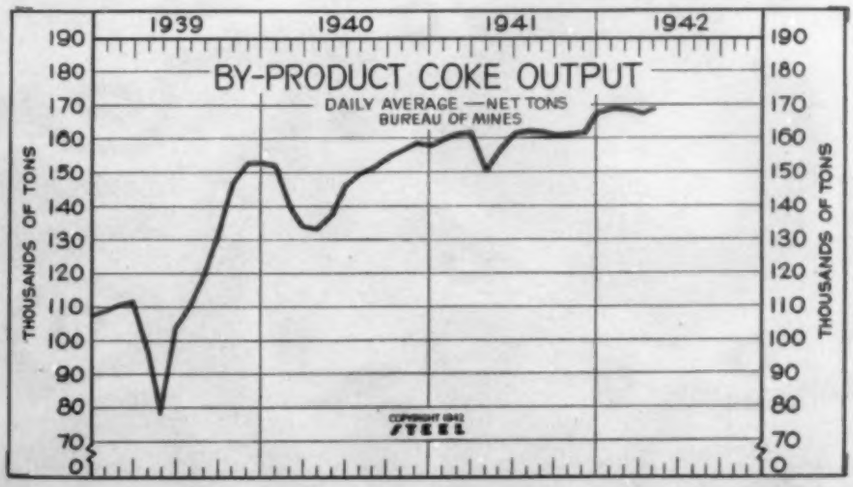
*Indicates deficit.

All Commodity Wholesale Price Index U. S. Bureau of Labor

(1926 = 100)

	1942	1941	1940	1939	1938
Jan.	96.0	80.8	79.4	76.9	80.9
Feb.	96.7	80.6	78.7	76.9	79.8
March	97.6	81.5	78.4	76.7	79.7
April	98.3	83.2	78.6	76.2	78.7
April	98.7	83.2	78.6	76.2	78.7
May	98.8	84.9	78.4	76.2	78.1
June	....	87.1	77.5	75.6	78.3
July	....	88.8	77.7	75.4	78.8
Aug.	....	90.3	77.4	75.0	78.1
Sept.	....	91.8	78.0	79.1	78.3
Oct.	....	92.4	78.7	79.4	77.6
Nov.	....	92.5	79.6	79.2	77.5
Dec.	....	93.6	80.0	79.2	77.0
Ave.	....	87.3	78.5	77.1	78.6

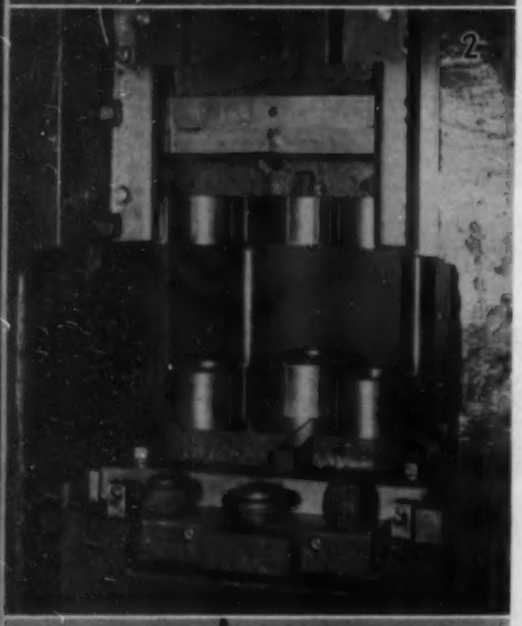




By-Product Coke Output

(Daily Average)

	1942	1941	1940	1939
Jan.	168,508	159,129	151,841	108,611
Feb.	168,414	160,789	138,508	109,923
March	167,733	161,268	133,056	110,921
April	168,966	149,144	132,812	97,155
May	.....	156,318	136,897	77,304
June	.....	161,201	145,821	102,991
July	.....	161,731	149,005	108,542
Aug.	.....	161,709	151,035	118,260
Sept.	.....	160,193	154,247	130,144
Oct.	.....	160,344	156,118	146,019
Nov.	.....	161,116	158,331	152,219
Dec.	.....	167,304	157,743	152,200
Total	.....	160,037	147,157	117,892



Forgings and Forging Practice . . . .

The Upsetter

(Section 13 in a Series on Forgings, Forging Methods and Forging Equipment)

By **ARTHUR F. MACCONOCHIE**
Head, Department of Mechanical Engineering
University of Virginia
University Station, Va.
And
Contributing Editor, STEEL

SINCE the introduction of hot-bolt-heading machines some 60-odd years ago, many advances have been made in upset forging practice, principally as a result of improvements in the design of the upsetter itself, and also as a result of the superior die steels that have become available. Thanks to the investigations carried out by the larger manufacturers of this type of forging machine, the rules which govern its action are now well understood and tools can now be designed successfully to produce forged parts in great variety.

Earlier fears that upsetting operations might open the fiber of the steel have been dispelled. By designing dies and the various forming stages always to keep the metal flowing under compression, it is possible to maintain compressive stresses within the blank during forging. This not only avoids fiber rupture but also is conducive to a high degree of grain refinement.

By way of exemplifying the simpler type of operation of which the upsetter is capable, Fig. 8 has been selected to exhibit the sequence of operations employed in forging the box end of an oil well sucker rod, recessed heading tools being used for the gathering operations. The piece starts from a long bar similar to the top specimen. The limiting consideration in an operation of this type is the amount by which the stock may be shortened or "upset" without buckling the unsupported portion of the bar. A study of the illustration will show just how much has been possible in each of the early operations. This is a good ex-

Fig. 1—Self-contained mechanical forging press rated 1600 tons capacity

Fig. 2—Dies and parts—a typical gear forging designed for press production

Fig. 3—Massive pitman and ram for large forging press. Pitman is cut from a section of rolled steel plate

Fig. 4—These are the tools and dies used to make ring forgings by the upset method. As is shown by the three parts in the foreground, a solid bar is upset and the ring sheared off the upset end, thus wasting no material

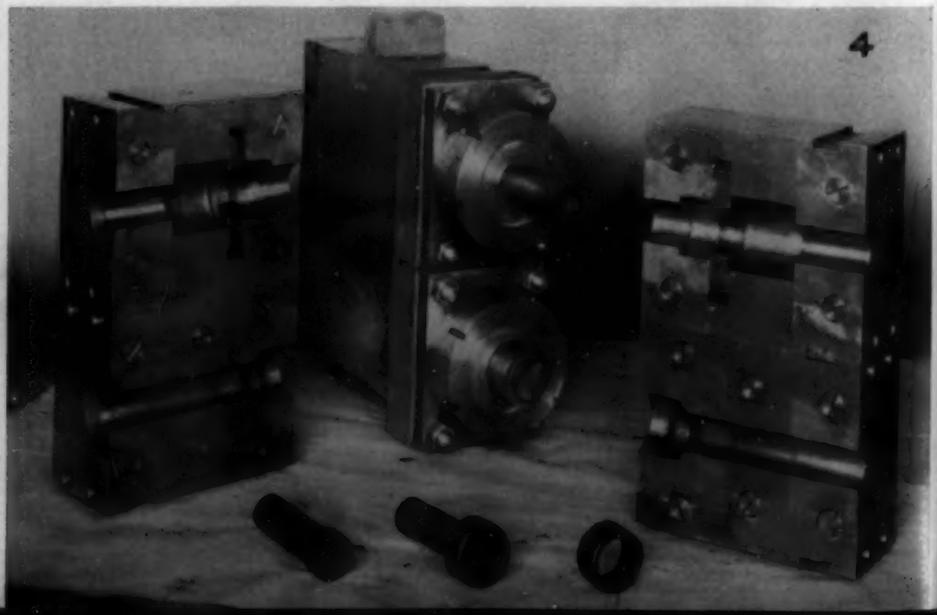


Fig. 5—Characteristic design of upsetter. Note massive castings to withstand tremendous forces developed. Figs. 1, 2, 3, 5 and 9 are Ajax Mfg. Co. photos

ample of how a rather large amount of stock is gathered on a relatively small diameter stock.

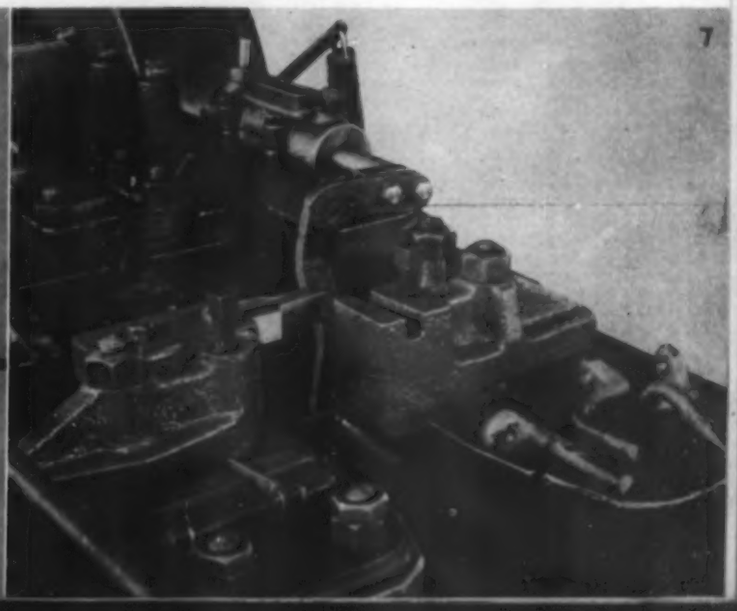
Coming now to a case which involves both upsetting and bending, Fig. 6 shows the dies and tools for producing railroad grab-iron forgings. In this particular example, the stock is fed from the bottom up, the bottom operation dies bending the stock as the jaws of the machine close and the tool on the ram coming forward to upset the stock and fill the cavity. The end result of this process is shown on the left in the foreground of the illustration. In the second operation, the metal which has been gathered on the end of the bar is squeezed to the shape shown second from the left in the foreground; while in the third operation, the grab iron is laid in the die with toe down and the hole punched. Bending of the iron is accomplished in the fourth or top operation. This also is well illustrated in Fig. 7, the part being laid in the recess in the stationary half of the jaws and the tool coming in from the left as the jaws close.

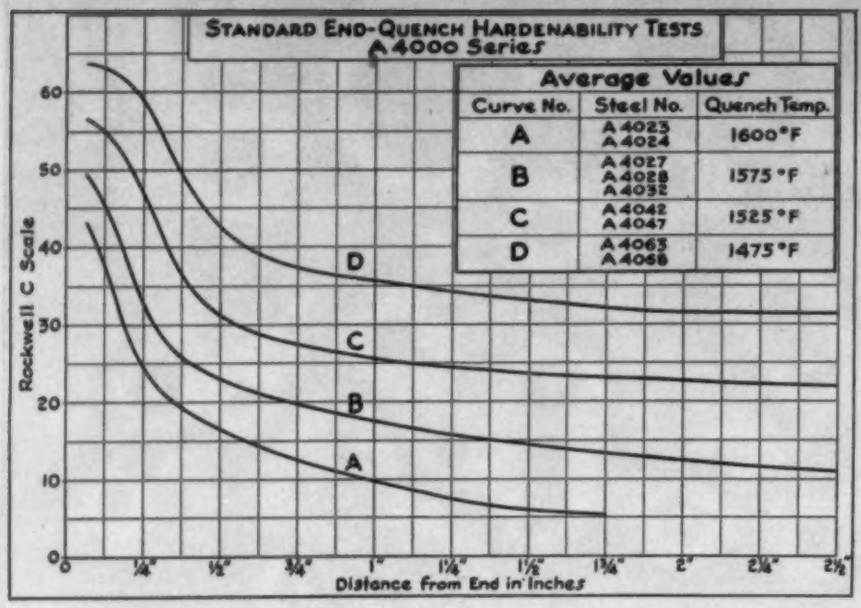
The dies and tools required for producing ring forgings are shown in Fig. 4. The heated bar is first buttoned on the end in the bottom groove; then in the second operation, the bar is punched out of the ring, thus avoiding waste of stock. Since there are only two operations,

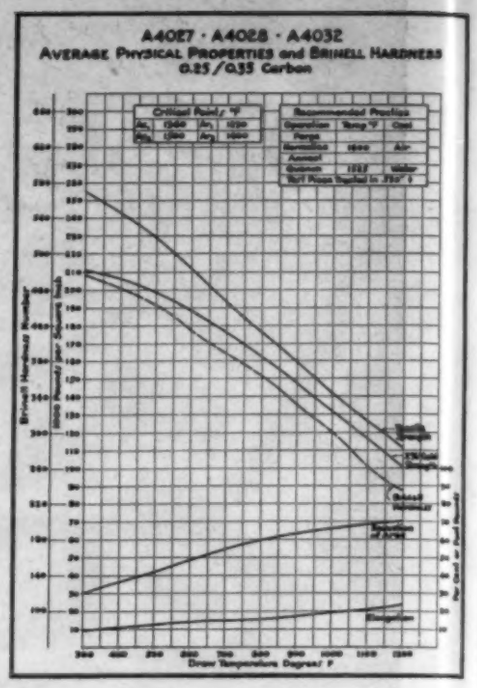
(*Please turn to Page* 105)

Fig. 6—In the foreground are specimens that illustrate the different successive stages utilized in producing the railroad grab iron shown at the extreme right. Upset forging and piercing operations are followed by two bending operations using the tools shown in the background

Fig. 7—This is a closeup of the tools mounted on the upsetter to handle the bending of the railroad grab iron shown in Fig. 6 and at the right foreground. Note the bending is done in two stages




STANDARD END-QUENCH HARDENABILITY TESTS
A4000 Series
Average Values
Curve No. | Steel No. | Quench Temp.
A | A4023 A4024 | 1600°F
B | A4027 A4028 A4032 | 1575°F
C | A4042 A4047 | 1525°F
D | A4063 A4068 | 1475°F
Rockwell C Scale
Distance from End in Inches



Properties of . . . .

The NEW NE (National Emergency) ALLOY STEELS

(Section III)

SUPPLEMENTING the 24 single-heat test charts published in STEEL, June 8, 1942, p. 66 (which material also included tables of analyses and possible alternates), and the 29 additional single-heat charts in the June 15 issue, p. 66, it is now possible, through courtesy of the American Iron and Steel Institute, to publish the first charts showing AVERAGE properties of some of these steels.

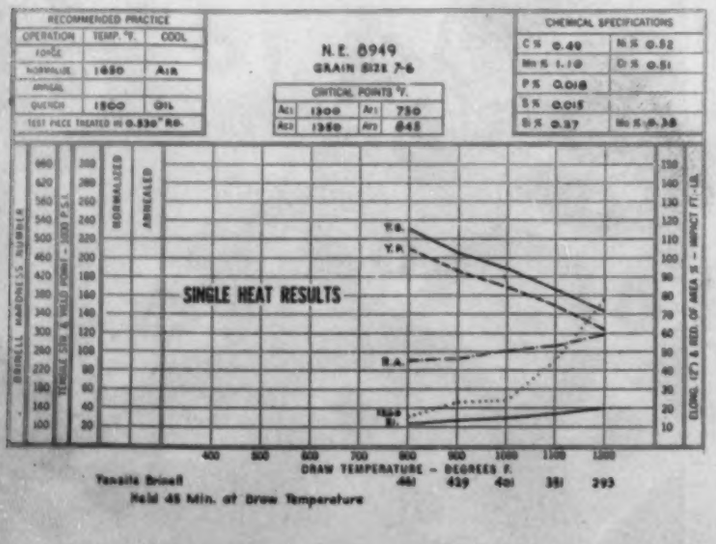
Herewith is presented a chart showing *average* values of hardenability for the A4000 series including A4023, A4024, A4027, A4028, A4032, A4042, A4047, A4063 and A4068.

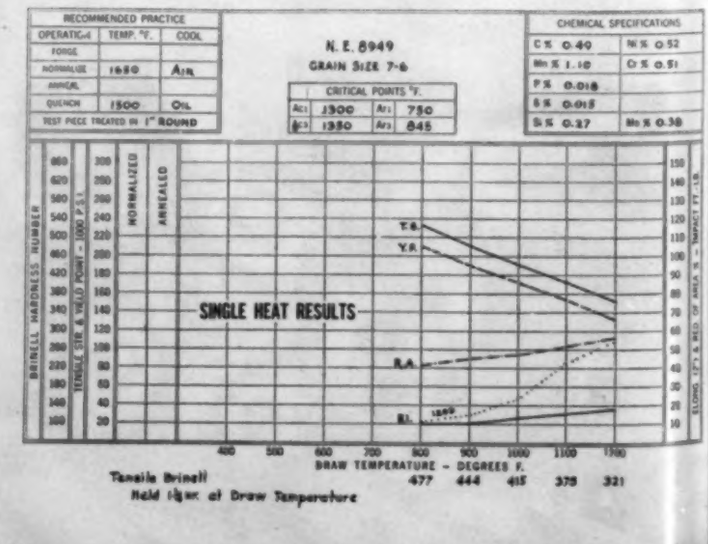
Also here are four charts showing *average* physical properties of A4027, A4028, A4032; A4037, A4042; A4047; and A4063, A4068. These charts give average values of tensile strength, 2 per cent yield strength, brinell hardness, reduction in area and elongation for various drawing temperatures up to 1200 degrees Fahr. Table I gives similar data for A4023-A4024 steels.

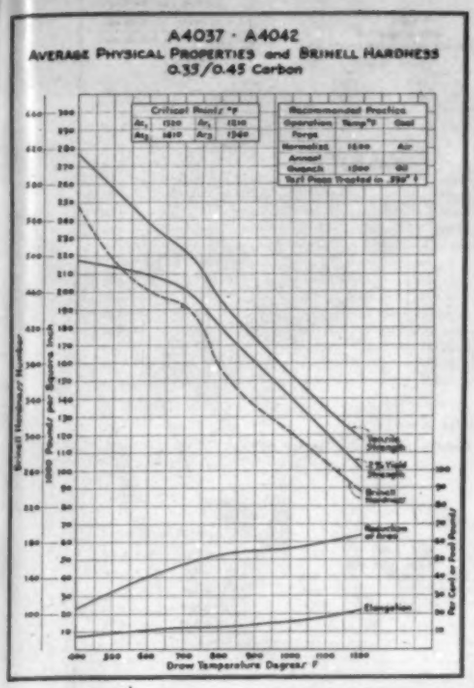
Single-heat test results of physical properties (tensile and yield strengths, reduction in area, elongation and impact values) shown here include six charts on NE 8949 covering test specimens starting with an 0.530-inch round held at draw temperature 45 minutes. Other specimens include a 1-inch round, held at draw temperature for 90 minutes; a 2-inch round, held 2½ hours; a 3-inch round, held 3¾ hours; a 4-inch round, held 4 hours; a 5-inch round, held 4 hours.

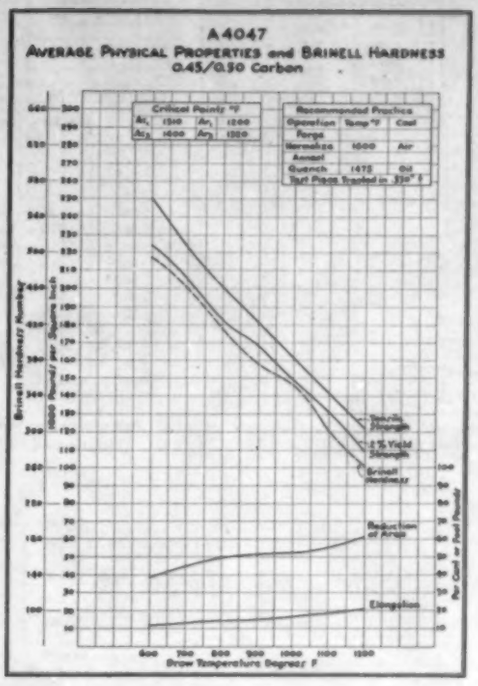
Other single-heat charts of physical tests include two for NE 8620 pseudo carburized at 1700 degrees Fahr. for 8 hours in two sizes, one specimen from a 0.530-inch round, another from a 1-inch round. Another pair of charts cover results of tests on the same two sizes of specimens but in NE 8817 steel.

The effect of mass is indicated by eight charts of single-heat test results on NE 8630, NE 8739, NE 8749 and NE 8949 steels. Two charts are presented for each analysis, one chart showing results when specimens









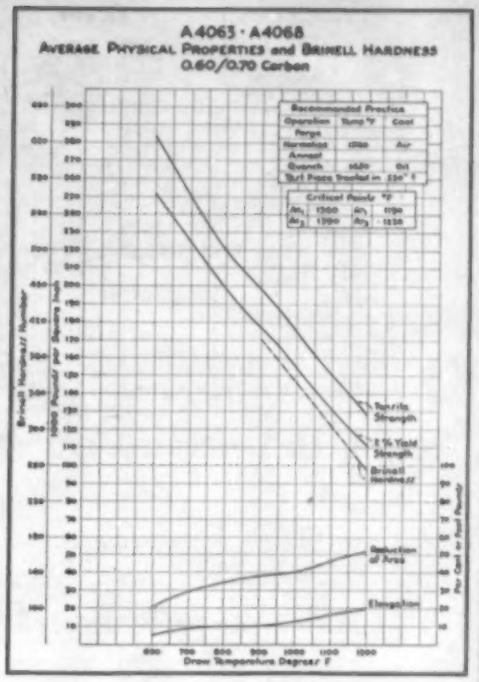


TABLE I—A4023—A4024

Average Physical Properties 0.15/0.25 Carbon
Heat Treatment

Normalized at 1600°F. for ½ Hour.
Heated to 1700° F. in Cast Iron Chips.
Held for 1 Hour and Quenched in Oil.
Drawn at 325°F. for 1 Hour.

Property	Average	Minimum	Maximum
.2% Yield Strength, p.s.i. .	120,000	105,000	135,000
Tensile Strength, p.s.i. ...	170,000	150,000	180,000
% Elongation	12.7	10.0	15.0
% Reduction	34.4	25.0	45.0
Brinell Hardness	311	285	363

were tempered at 1000 degrees Fahr., the second when tempered at 1100 degrees Fahr.

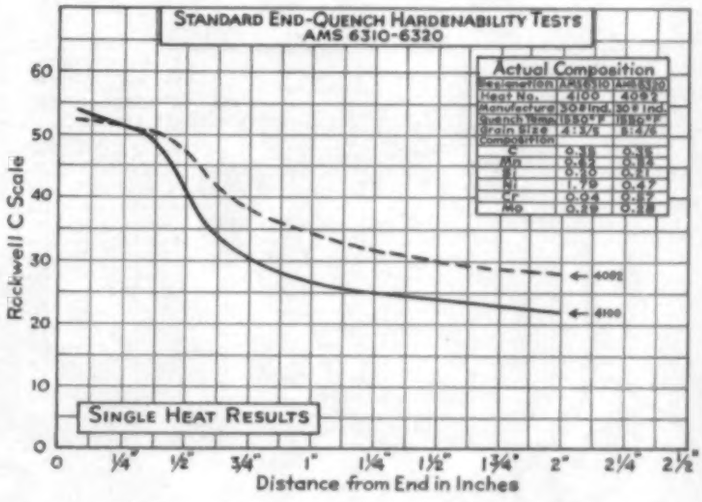
Data on response to tempering are given by six charts showing single-heat results on NE 8339, NE 8442, NE 8547, NE 8630, NE 8744 and NE 8949 steels.

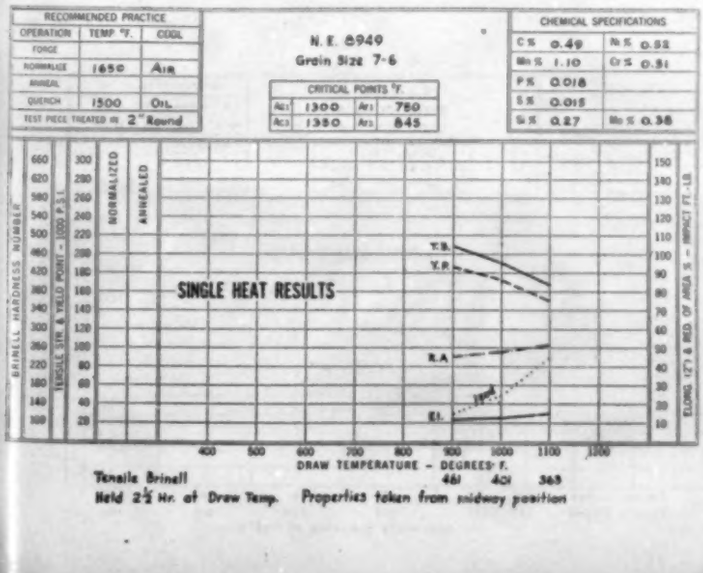
A chart is also included showing single-heat results of hardenability tests on AMS 6310-6320, an alloy in the Aircraft Material Specifications list.

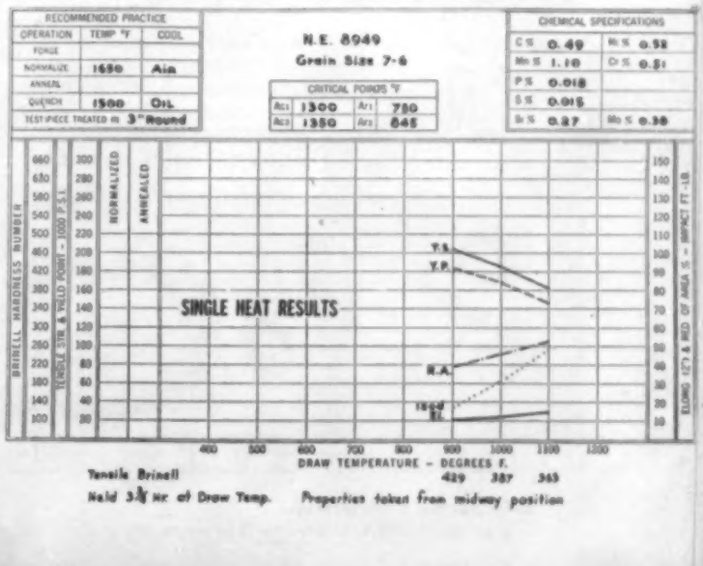
Subsequent material expected to be available for publication shortly includes additional data on physical properties (single-heat results). Within a few months it is expected that sufficient data of this type will have been collected to make possible the preparation of *average* curves.

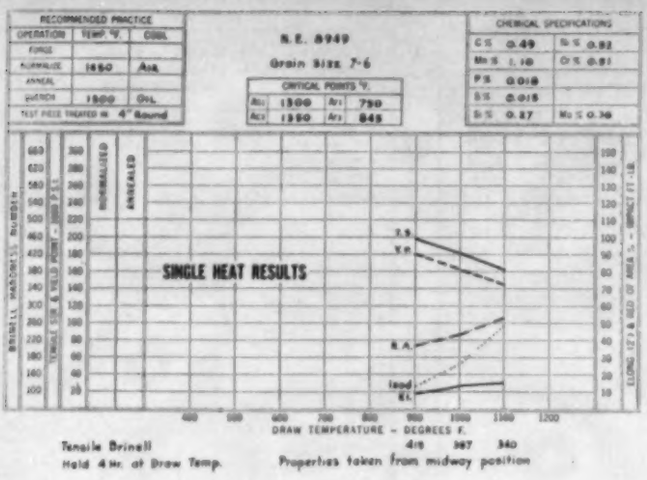
A planned research program is now securing data on sub-zero Izod impact values which will be available soon. In co-operation with the American Iron & Steel Institute which is acting as the vehicle for distributing this information as it is accumulated, STEEL will continue to publish all data on these new alloys as quickly as it is available.

These charts also appear on pages 82, 84, and 86.



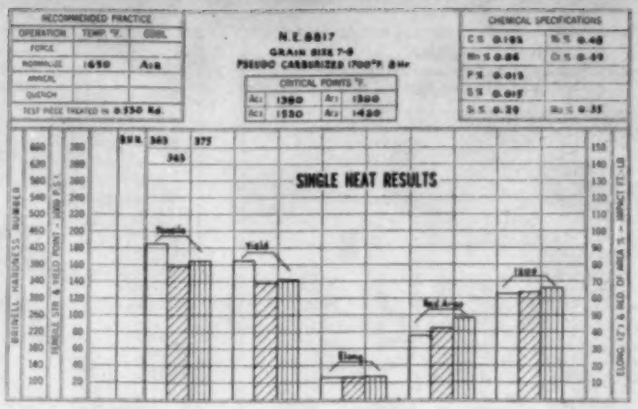






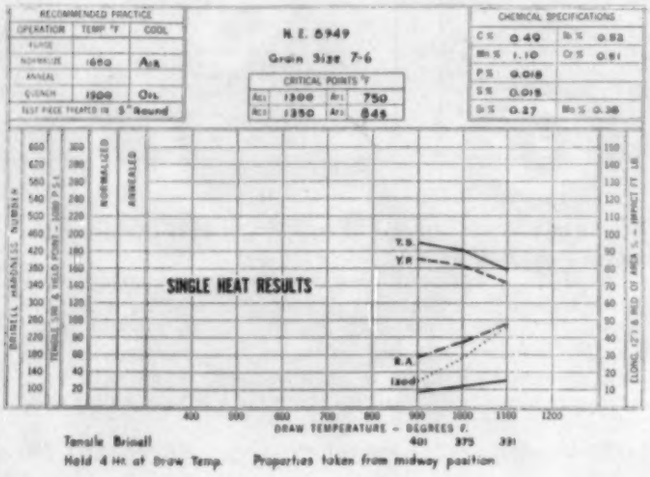
Tensile Brinell
Held 4 Hr. at Draw Temp.

Properties taken from midway position



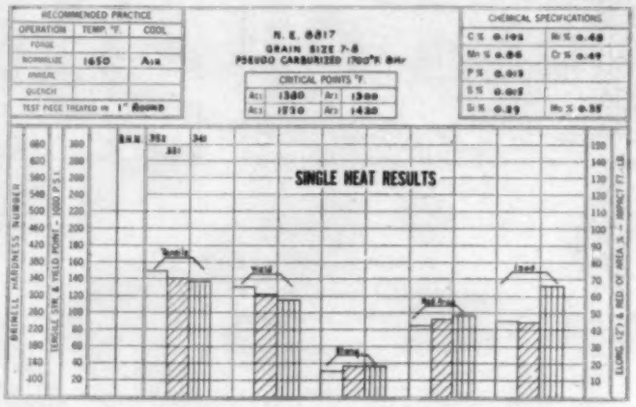
Held at Draw Temp. of 300°F for 45 Min.

☐ Direct Quench ▨ Air Cool, Rch. 1525 ▥ Air Cool, Rch. 1550



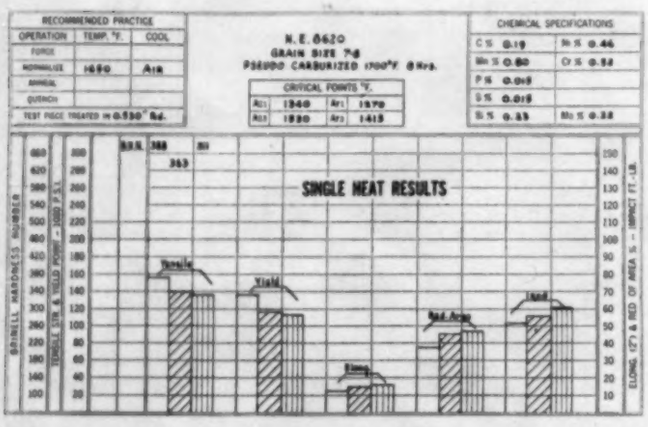
Tensile Brinell
Held 4 Hr. at Draw Temp.

Properties taken from midway position



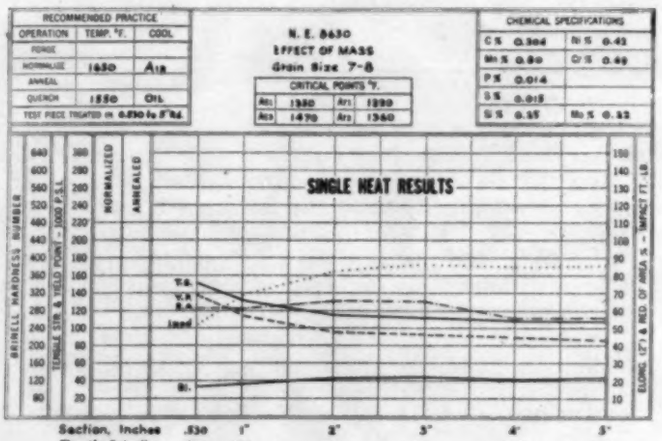
Held at Draw Temp. of 300°F. for 1½ Hr.

☐ Direct Quench ▨ Air Cool, Rch. 1525 ▥ Air Cool, Rch. 1550

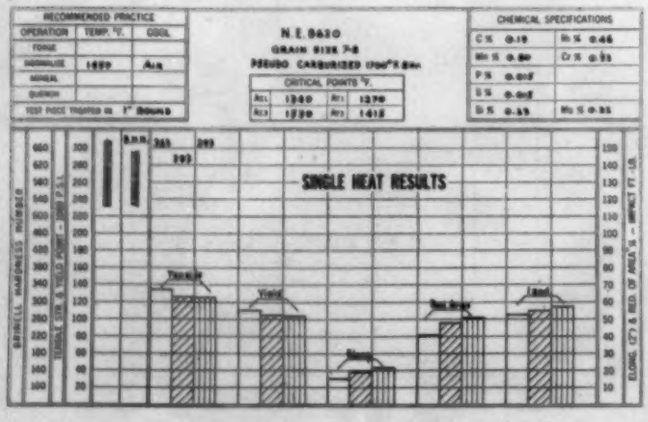


Held at Draw Temp. of 300°F. for 45 Min.

☐ Direct Quench ▨ Air Cool, Rch. 1525 ▥ Air Cool, Rch. 1550

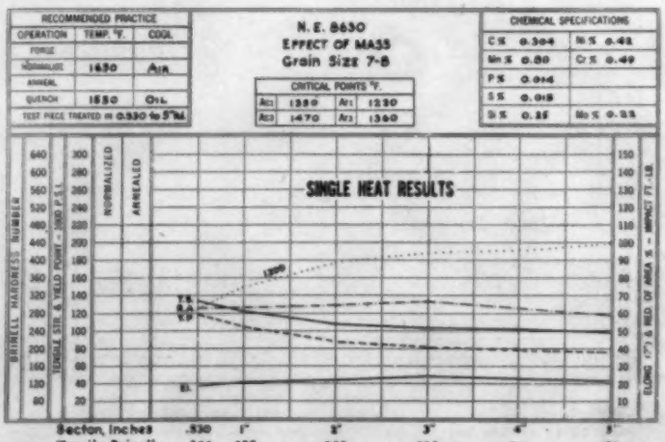


All specimens tempered at 1000°F



Held at Draw Temp. of 300°F. for 75 Min.

☐ Direct Quench ▨ Air Cool, Rch. 1525 ▥ Air Cool, Rch. 1550



All specimens tempered at 1100°F

to help YOU

do a trouble-shooting job

in the production of Stainless Parts

You and your men no doubt know many short-cuts as a result of your experience in fabricating Stainless Steel. We'd like to help you add to that knowledge by giving you the benefit of our experience in solving Stainless problems. So here are some suggestions collected from Carpenter metallurgists, research men and service representatives who have devoted much of their lives to solving our customers Stainless fabricating problems.

In many plants, Carpenter men are being asked to solve special corrosion and heat resistance problems . . . and then shoot trouble along the production lines. Because time is short, they can not be everywhere at once. But much of their experience can be made available to you through these pages, and by correspondence with the mill. Write us about your specific Stainless problems.

Adjust Press Speeds For MORE Output!

Perhaps your press speeds are OK. Maybe an increase in press speed is needed. Or a quick checkup may even show that a reduction of 10 to 15% would increase output and conserve metals. Often, slower press speeds will overcome die galling that can spoil parts and interrupt production.

Saved: 30,000 pounds of Stainless!

From 45,000 lbs. of Stainless Sheet to only 15,000 lbs. of narrow Stainless Strip—for making the same number of aircraft parts! Saved: 30,000 lbs. of vital metal, *and* the time required to slit and handle the sheet. Check the use of narrow strip on your jobs where Sheet is used.

How About Layouts?

Keep skeleton scrap losses to an absolute minimum. Spend a few hours now to re-check layouts on jobs that are stamped from strip. The results will be well worthwhile.

Check Your Rejects . . .

Material that is not uniform throughout can cause many a headache such as wrinkling in the die. Then too, tearing and galling can also result from using off-size material. But *whenever* rejects are high, it will pay you to check *all along the line.*

The Carpenter Stainless Slide Chart is a useful "assistant" to have at your elbow. It provides data on the welding, heat resisting and machining properties, etc. of each grade of Stainless Steel. A note on your company letterhead will bring you a Slide Chart — free to Stainless Steel users in the U. S. A.

THE CARPENTER STEEL COMPANY
139 Bern Street Reading, Pa.

Carpenter STAINLESS STEELS

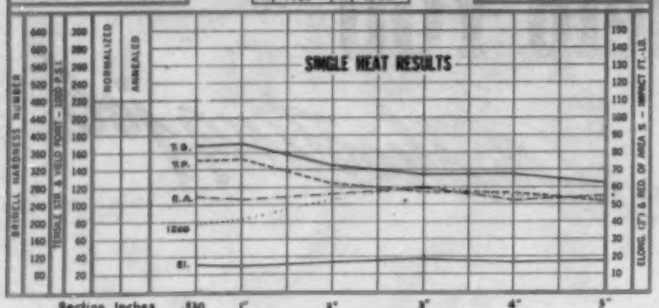
BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE	1650	Air
ANNEAL		
QUENCH	1525	Oil
TEST PIECE TREATED IN 0.530 to 5" Rad.		

N. E. 8739
EFFECT OF MASS
GRAIN SIZE 7-8

CRITICAL POINTS °F.			
Ac1	1350	Ar1	1190
Ac3	1450	Ar3	1300

CHEMICAL SPECIFICATIONS	
C % 0.41	Ni % 0.46
Mn % 0.84	Cr % 0.47
P % 0.015	
S % 0.019	
Si % 0.21	Mo % 0.36



Section, Inches	.530	1"	2"	3"	4"	5"
Tensile Brinell	365	363	331	321	302	286

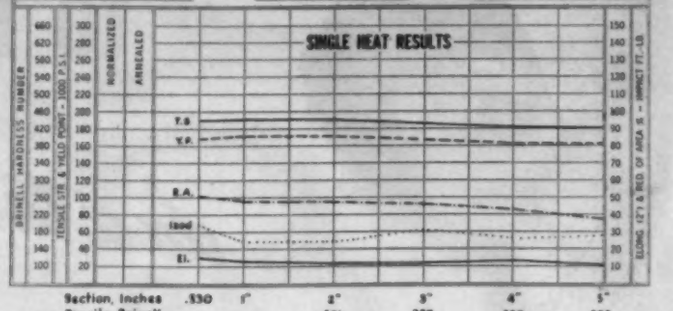
All specimens tempered at 1000°F

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE	1650	Air
ANNEAL		
QUENCH	1500	Oil
TEST PIECE TREATED IN .530 - 5" Rd.		

N. E. 8949
EFFECT OF MASS
GRAIN SIZE 7-8

CRITICAL POINTS °F.			
Ac1	1300	Ar1	790
Ac3	1390	Ar3	845

CHEMICAL SPECIFICATIONS	
C % 0.49	Ni % 0.52
Mn % 1.10	Cr % 0.51
P % 0.018	
S % 0.015	
Si % 0.27	Mo % 0.38



Section, Inches	.530	1"	2"	3"	4"	5"
Tensile Brinell		401	387	387	378	

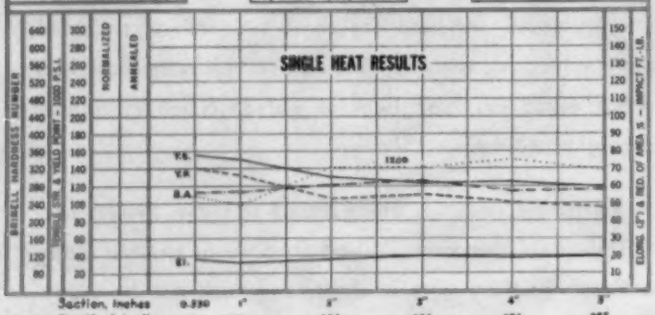
All specimens tempered at 1000°F. All specimens taken from midway position

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE	1650	Air
ANNEAL		
QUENCH	1525	Oil
TEST PIECE TREATED IN 0.530 to 5" Rad.		

N.E. 8739
EFFECT OF MASS
GRAIN SIZE 7-8

CRITICAL POINTS °F.			
Ac1	1350	Ar1	1190
Ac3	1450	Ar3	1300

CHEMICAL SPECIFICATIONS	
C % 0.41	Ni % 0.46
Mn % 0.84	Cr % 0.47
P % 0.015	
S % 0.019	
Si % 0.21	Mo % 0.36



Section, Inches	0.530	1"	2"	3"	4"	5"
Tensile Brinell	311	321	286	286	286	255

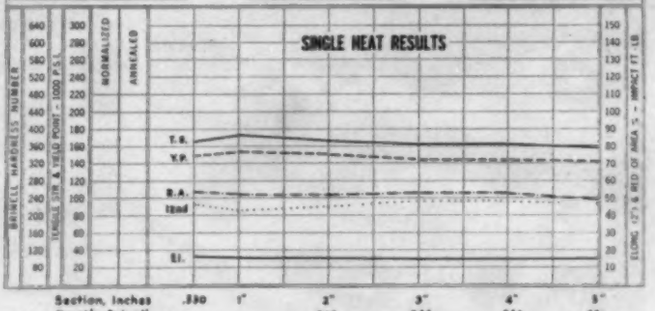
All specimens drawn at 1100°F

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE	1650	Air
ANNEAL		
QUENCH	1500	Oil
TEST PIECE TREATED IN .530 - 5" Rd.		

N. E. 8949
EFFECT OF MASS
GRAIN SIZE 7-8

CRITICAL POINTS °F.			
Ac1	1300	Ar1	790
Ac3	1390	Ar3	845

CHEMICAL SPECIFICATIONS	
C % 0.49	Ni % 0.52
Mn % 1.10	Cr % 0.51
P % 0.018	
S % 0.015	
Si % 0.27	Mo % 0.38



Section, Inches	.530	1"	2"	3"	4"	5"
Tensile Brinell		383	383	340	331	

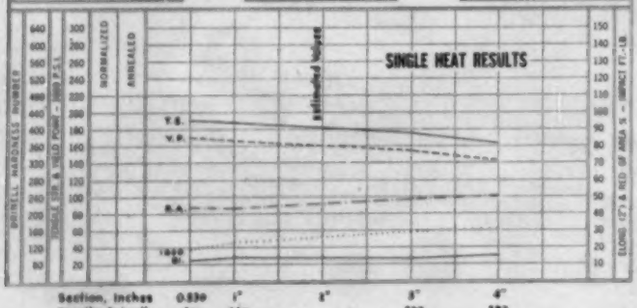
All specimens tempered at 1100°F. All specimens taken from midway position

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE	1650	Air
ANNEAL		
QUENCH	1900	Oil
TEST PIECE TREATED IN 0.530 to 4" Rd.		

N. E. 8749
EFFECT OF MASS
GRAIN SIZE 7-8

CRITICAL POINTS °F.			
Ac1	1340	Ar1	1210
Ac3	1430	Ar3	1240

CHEMICAL SPECIFICATIONS	
C % 0.346	Ni % 0.46
Mn % 0.83	Cr % 0.53
P % 0.017	
S % 0.015	
Si % 0.33	Mo % 0.37



Section, Inches	0.530	1"	2"	3"	4"
Tensile Brinell	401	387		387	387

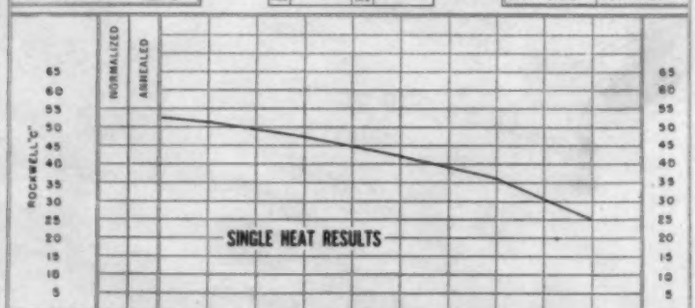
All specimens tempered at 1100°F
No specimens tested in 2" round

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE		
ANNEAL		
QUENCH	1550	Oil
TEST PIECE TREATED IN 1" ROUND		

N.E. 8339
RESPONSE TO TEMPERING

CRITICAL POINTS °F.			
Ac1		Ar1	
Ac3		Ar3	

CHEMICAL SPECIFICATIONS	
C % 0.36	Ni %
Mn % 1.45	Cr %
P % 0.018	
S % 0.024	
Si % 0.26	Mo % 0.24

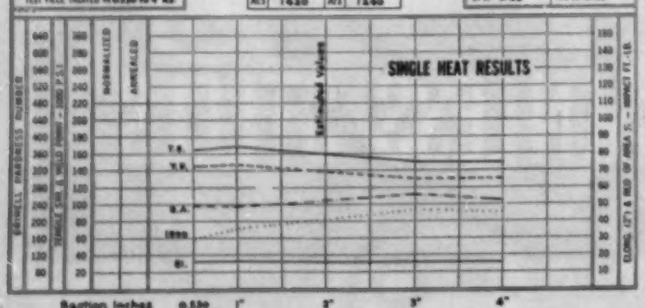


RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE	1650	Air
ANNEAL		
QUENCH	1500	Oil
TEST PIECE TREATED IN 0.530 to 4" Rd.		

N. E. 8749
EFFECT OF MASS
GRAIN SIZE 7-8

CRITICAL POINTS °F.			
Ac1	1340	Ar1	1210
Ac3	1430	Ar3	1240

CHEMICAL SPECIFICATIONS	
C % 0.346	Ni % 0.46
Mn % 0.83	Cr % 0.53
P % 0.017	
S % 0.015	
Si % 0.33	Mo % 0.37



Section, Inches	0.530	1"	2"	3"	4"
Tensile Brinell	363	321		332	340

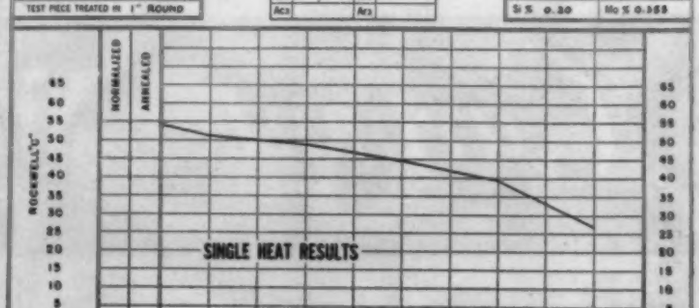
All specimens tempered at 1100°F
No specimens tested in 2" round

RECOMMENDED PRACTICE		
OPERATION	TEMP. °F.	COOL
FORGE		
NORMALIZE		
ANNEAL		
QUENCH	1550	Oil
TEST PIECE TREATED IN 1" ROUND		

N.E. 8442
RESPONSE TO TEMPERING

CRITICAL POINTS °F.			
Ac1		Ar1	
Ac3		Ar3	

CHEMICAL SPECIFICATIONS	
C % 0.425	Ni %
Mn % 1.39	Cr %
P % 0.018	
S % 0.024	
Si % 0.30	Mo % 0.258



Information taken from "Steel"

American industry is completing the first phase of its war job. It has passed the peak of the "tooling up" period. It is ready for the second phase — unprecedented, large scale production.

To succeed in its objective, industry must turn out with the facilities now at hand or in sight a maximum of the goods essential to victory with a minimum consumption of virgin critical materials and with a minimum expenditure of time and manpower.

This calls for ingenuity, skill and resourcefulness of a high order. Not every company has all of these qualities in abundance. But here and there some company has hit upon a timely solution to a specific problem. One has been unusually successful in the use of substitutes. Another is adept in production short-cuts. A third has worked out an effective salvage problem.

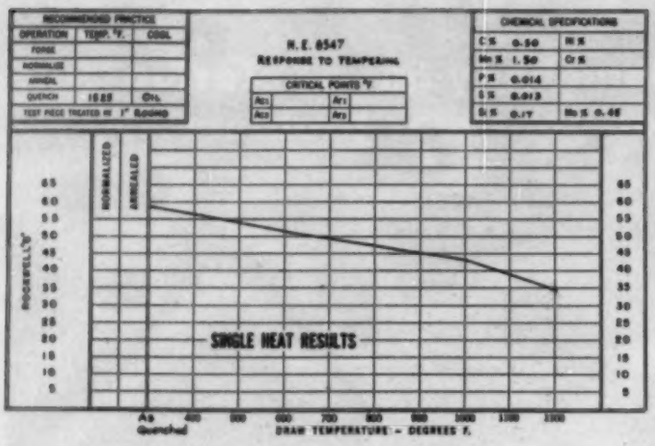
If the best solutions of each detailed problem of war production can be made available to all manufacturers, the effectiveness of the war effort of the entire arsenal for democracy will be lifted appreciably.

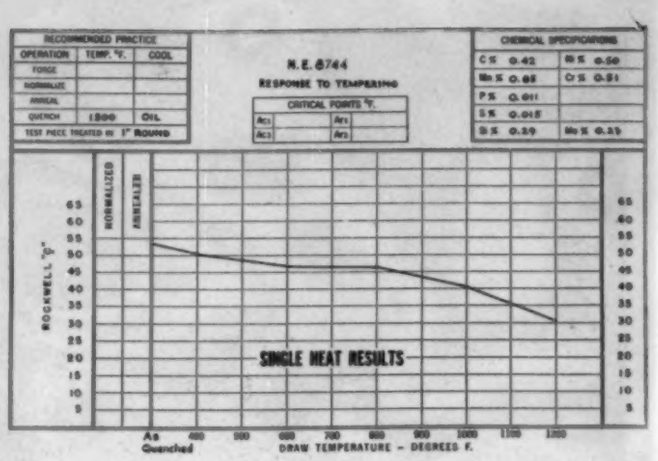
This is the first of a series of messages to American Industry aimed at this objective.

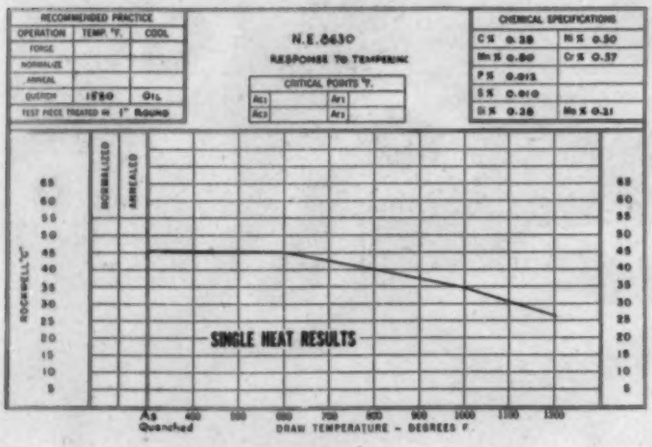
CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

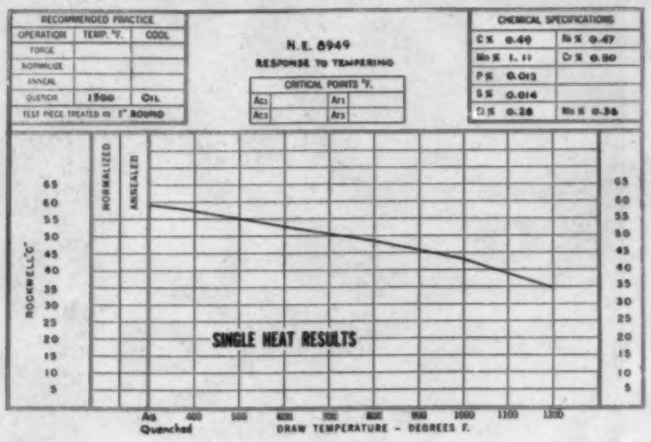
Climax Molybdenum Company
500 Fifth Avenue • New York City

MOLY









Sherwin-Williams Cuts Plate Demand in Half

Due to its conservation measures —resorting to use of paper containers for its paints, and having its large drums returned for reuse— Sherwin-Williams Co., Chicago, reports it is now able to get along with less than half as much plate as it used in 1940.

No tin at all is required for the top and bottom metal disks incorporated in the paper paint containers the company recently developed. The disks are made of alloy-coated plate substituted for tin plate several years ago. Body of the containers is nothing more than cardboard impregnated with an insoluble solution.

Further experiments, according to the paint concern, are already underway to bring about complete elimination of the alloy plate and permit the metal disks to be manufactured of lacquered black plate.

The company, however, does not claim that the new containers are as good as the all-metal containers, but it believes they will do for the duration.

In order to obtain maximum use from its large metal drums, Sherwin-Williams is placing a billing charge on them, refunding the charge when the drum is returned empty. Thus, when returned, the drums are scoured, spray-finished and put back into use.

Develops Material for Repairing Flashings

Flexrock Co., Twenty-third and Manning streets, Philadelphia, reports a new "flashing method" for repairing worn-out flashings. It is said to do the work of copper or lead. Applied by brush, the material makes a permanent replacement and adheres tightly to all types of industrial roofs, including corrugated iron, according to the company.

Improving Copper with Silver Gains Attention

Improving copper by the addition of small percentages of silver has been gaining serious consideration lately, according to the American Silver Producers' Research Project, New York. Silver is especially useful in copper which is to be soldered, as the heat applied does not result in undue softening of such an alloy, the research unit claims.

In commutator bars, for example, a small percentage of silver insures that hardness will be maintained. Fractional percentages of silver in photo-engravers' plates prevent the softening of cold-rolled copper sheet while it is processed at elevated temperatures. A welding rod containing about 1 per cent silver and a trace of deoxidizer, the remainder being copper, is said to be favored by coppersmiths.

Some commercial copper alloys designed for high conductivity contain about 1 per cent of silver and over 95 per cent of copper, though hardening elements such as beryllium, cobalt, cadmium or tin may be added.

Silver is often an important element of brazing alloys in which copper, even up to 85 per cent, is one ingredient, but in these alloys 10 per cent or more of silver is commonly used. High fluidity and good penetration into small clearances, as well as low melting points, are among the advantages gained by the use of silver in such alloys, according to the research organization.

ZINC IN WAR

10 GALVAN-IZING

Zinc Coated Steel Cables for Barrage Balloons

ADEQUATE GALVANIZING REQUIRED

The standard for U. S. Army and Navy purchases is *the best available*—and that is as it should be. Not only do our fighting forces deserve the best in performance, but quality insures obtaining full value for every war dollar. Typical of this economy are those war applications of iron and steel which involve corrosion problems. In such cases, *adequate* galvanizing (zinc coating) is required—because scant galvanizing wastes zinc, time and money.

The U. S. Bureau of Standards (Circular 80) states that zinc is "by far the best" protective metallic coating for the rust-proofing of iron and steel. Because zinc is above iron in the electromotive series, corrosion will attack zinc first, thereby protecting the iron from rust. Even though iron or steel is exposed in small areas such as at cut edges, in a protective coating, it is not corroded—if that coating is zinc.

Galvanizing serves the war program in many ways. Illustrated above and below are the all-important *galvanized steel cables on a barrage balloon*, and a few other typical examples of war galvanizing are shown in the background of this page; (1) portable steel landing field, (2) corrugated iron bomb shelter, (3) merchant marine wire rope hoist, (4) wire netting for camouflage. Not illustrated is the all-important zinc-coated pipe on ships.

It is the job of the zinc industry to see that sufficient zinc is available to provide *adequate* galvanized coatings for all-important war applications. This is a major reason why civilian users of metal and pigment may not be able to obtain all of the zinc they would like to have.

THE NEW JERSEY ZINC COMPANY

MANUFACTURERS OF THE FAMOUS HORSE HEAD ZINC PRODUCTS

1 HULL PLATES
2 RUBBER
3 PAINT
4 BRASS
5 CERAMICS
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7 PHARMA-CEUTICALS
8 METAL SPRAYING
9 STAMPING DIES

FOR VICTORY
BUY UNITED STATES WAR SAVINGS BONDS STAMPS

What an English Company Accomplished in

CONVERTING TO WAR PRODUCTION

. . . . and some details on the British system employed to control and direct production of all items—military and civilian

By VINCENT DELPORT
European Editor, STEEL

And

J. A. HORTON
British Editor, STEEL

SOME IDEA of the way in which British firms have carried out conversion from unessential civilian to war production can be gathered from examining the changes which took place in an English automobile factory.

When war broke out this firm had approximately 4000 machine tools, all engaged and lined up for production of their various models. Today, only two of these models are being built—these going to war departments. On the other hand, output of road trucks, modified to suit war conditions, has been almost trebled. In the early stages of the war, much was done to encourage and stimulate export trade to build up favorable trade balances to purchase needed war supplies. It became necessary after a short time to discontinue this, however. This firm was doing a fair amount of oversea business, but the ban on export released certain machines, enabling these to be diverted to essential war products.

One of the chief features in the changeover has been that whereas manufacture was previously confined to cars or trucks, it now covers a wide variety of war products such as stationary engines, aircraft engines, fuel tanks, air frames and other aircraft components; transmission units for tanks; ammunition boxes and magazines.

The reconditioning of engines for the war services is also carried on here.

The various Ministries soon got down to their task of providing for the huge war machine necessary to beat Hitler.

A great many inquiries, accompanied by drawings, came in and were checked over and considered in the planning office. Planning lists were prepared in order to see what plant could be utilized in order to give the output required by the Ministry.

Next came the important step of clearing areas in the works so that machinery could be lined up to deal with the contract. Designing of jigs and tools proceeded from the plan sheets, and orders for their manufacture were given out to the firm's own tool room. The whole plant is co-ordinated so as to be able to commence production at the required moment. One result of dealing with so many different Ministry contracts has been that machine shops have been far more congested than in peace time. A bigger strain on storage space has also been inevitable because of the great variety of raw materials and finished products rolling from production lines.

A large building which formerly housed the car finishing and despatch department is now entirely devoted to the manufacture of two types of air frames. Similarly, the car body building department which was before the war a separate section of the works is now occupied by machines producing various types of ammunition boxes, magazines and other sheet metal components used in the war.

Here, not one, but six different types of magazines are being made, and the company has built its own firing range for testing the products it makes.

A new technique has of course to be brought in when a firm of this kind suddenly finds itself thrust into a trade with which it had not the remotest connection before the war. New processes, especially in finishes, are in use.

Permits Release Machines

After detailed planning and estimating on contracts received, it becomes possible to say how many jigs and tools and how many machines can be made available in the works, and how many will be required from the appropriate government department so as to complete a "production flow section". The government has to be convinced that such machines are absolutely necessary.

The manufacturer cannot go to the maker of the machine and buy it without a permit, even if such machine were available.

Designers formerly doing automobile work have had to adapt their ideas to those of the Ministries in regard to the designing of special vehicles.

In this particular factory, they have had to familiarize themselves with gun, airplane and tank practice. Inspection men have had to conform to the stringent requirements of the Ministries. Contracts are subject to inspection by technical cost officers who may query prices of tools or any other point involved in the cost of the job.

As is well known, the high-grade materials used in the manufacture of war components call for special treatment. Heat treating systems had to be improved. In addition, the company is dealing with a multiplicity of steels as compared with only a few in pre-war production.

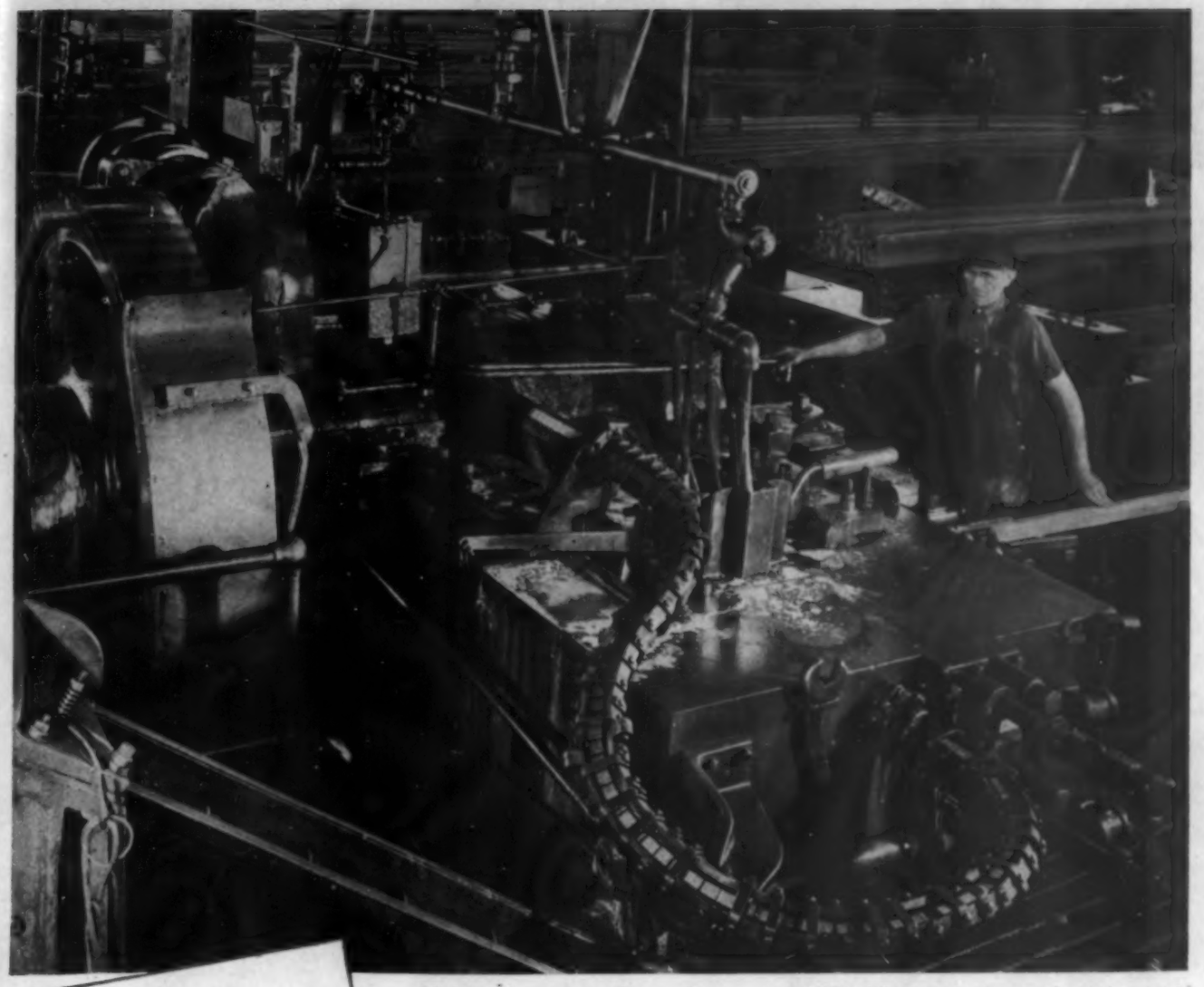
A big change has taken place in the foundry where cast iron was mainly used. Since the war, steel has been the chief metal, steel castings being made for tanks, heavy road vehicles and other work. The firm also has its own drop stamping shop and 60 per cent of the output is for the various Ministries, the remainder being consumed in the works. A fair proportion of the machine tools employed here are of the single-purpose type suitable for automobile work and could not readily be adapted to other work. Some have been adapted, however. Other special machines have been made by the firm to handle ordnance work.

Labor requirements must be budgeted the same as machines. When new sections of the production line are installed, skilled labor is taken from other departments and the remaining labor diluted with women workers or "green" labor. Toolsetters, charge hands, and the like are up-graded to take charge of the new section. Female labor has, of course, increased considerably since the war began. To some extent, also, part-time workers are being used successfully. The selection of suitable labor, however, presents difficulty, especially among the women.

Whenever labor is withdrawn from one section to another, the process has to be carried out with as little interference as possible to production as a whole. Prior to the war some 12,000 persons were employed; this has now increased to 16,000 with a large proportion of women workers. Increased welfare work has had to be carried out, such as the greater provision of canteens and medical services.

For the safety of the workpeople and to comply with government

(*Please turn to Page* 117)



The hole in the nut is started by a punching operation. At R B & W's Coraopolis plant, punching is done at right angles to the steel's flow lines, instead of parallel to them; this eliminates danger of splitting and stripping.

We make holes that give freight a safer ride

LOOK FROM YOUR PULLMAN WINDOW as you approach the Horseshoe Curve . . . there's a freight across the way Eastbound down into Altoona, like you; a second is passing the first, straining up the mountain; a third moves by the window across the aisle. Or count the cars one of the many times you'll wait for freights on the outskirts of Chicago. Or watch the youngsters tumble from a troop train in your city's railroad yards, to limber up their joints.

They're hauling heavier loads, today, those trains, important loads. And those factories of ours, like that big, modern, one-purpose nut-making plant at Coraopolis, are busy turning out the right-fitting fastenings that, the new car makers know, will *hold* against the bucking strain and mighty tremble of the battering miles.

For the men who buy bolts and nuts by *tons* know that R B & W's Empire Brand gives them unvarying flawlessness . . . accuracy of shape and thread insuring speedy assembly . . . delivery that's as prompt as our extra efforts can make it.

Russell, Burdsall & Ward Bolt and Nut Company. Factories at Port Chester, N. Y., Rock Falls, Ill., Coraopolis, Pa.; sales offices at Philadelphia, Chicago, Detroit, Chattanooga, Los Angeles, Portland, Seattle.

RB&W **RUSSELL, BURDSALL & WARD**

Making strong the things that make America strong

BOLTS NUTS RIVETS EMPIRE

AND ALLIED FASTENING PRODUCTS...SINCE 1845

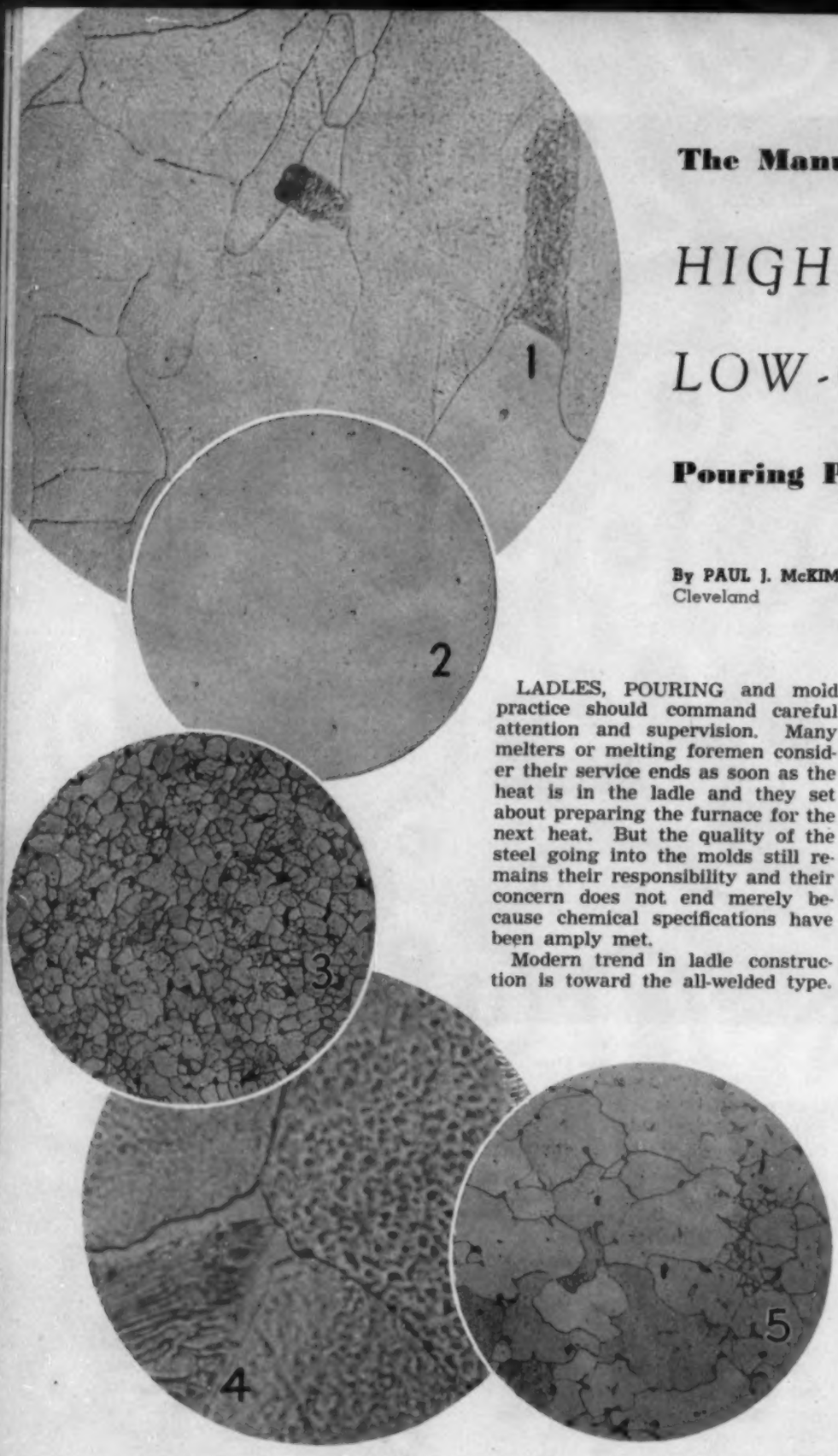


Fig. 1—Photomicrograph of sponge iron treated in open-hearth slag thimble. X300. Etched with 2 per cent nitric acid

Fig. 2—Photomicrograph of treated sponge iron after forging showing minute inclusions. X100. Unetched

Fig. 3—Photomicrograph of treated sponge iron after forging showing small crystal grains. X100. Etched with 10 per cent Nital

Fig. 4—Photomicrograph of sponge iron treated in open-hearth slag thimble. X1500. Etched with 2 per cent nitric acid

Fig. 5—Photomicrograph of treated sponge iron before forging showing large crystal grains. X100. Etched with 10 per cent Nital

The Manufacture of

HIGH-QUALITY, LOW-COST STEEL

Pouring Practice

By PAUL J. McKIMM
Cleveland

LADLES, POURING and mold practice should command careful attention and supervision. Many melters or melting foremen consider their service ends as soon as the heat is in the ladle and they set about preparing the furnace for the next heat. But the quality of the steel going into the molds still remains their responsibility and their concern does not end merely because chemical specifications have been amply met.

Modern trend in ladle construction is toward the all-welded type. Low-alloy high-tensile steel used for this purpose allows a greater load of molten metal to be handled. While deep ladles still are used, the oval ladle is gaining favor. The shorter or more shallow ladle influences the ingot quality by decreasing the ferrostatic pressure. Hence, there is a smooth flow of metal and a more even fill of the mold during the pour. Scabs are decreased because of the initial pressure drop of the ingot immediately after the shutoff.

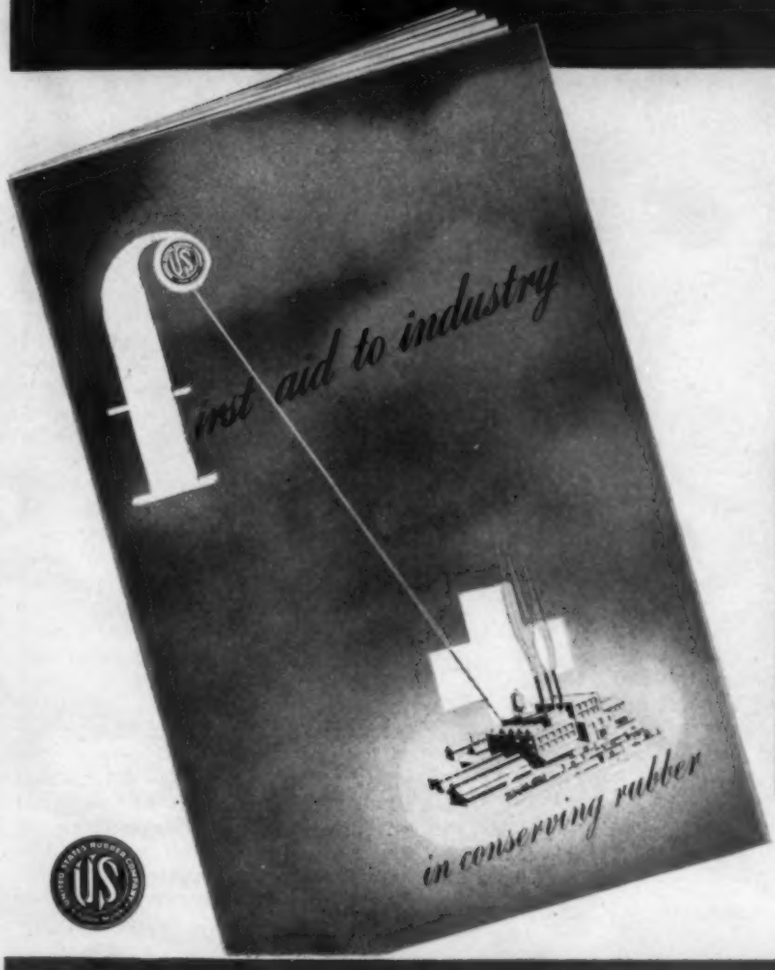
Twin Nozzle Practice

Two-nozzle ladles have advantages and disadvantages. Pouring costs are higher. Stopper failure is traceable to an improper assembly, careless setting, large skulls, or to improper handling where the steel pourer bends the rod or gets the stopper out of the well. In the case of skulls a second nozzle assembly would also fail. However, a double-nozzle setup permits a large heat to be poured into a large number of small molds; a portion of the heat can be poured with one nozzle and the balance with the second nozzle assembly. Where small size molds are used, the best procedure is to teem them in groups by bottom pouring practice, or by group pouring by basket or tuning dish.

A small quantity of adamite cement applied at the butting joints of the sleeves greatly reduces rod failure. Remelting scrap has been produced in the slag thimble by filling the bottom with sponge iron and permitting the slag from the steel ladle to overflow into the thimble. Figs. 1 and 4 are photomicrographs of such treated iron before any work.

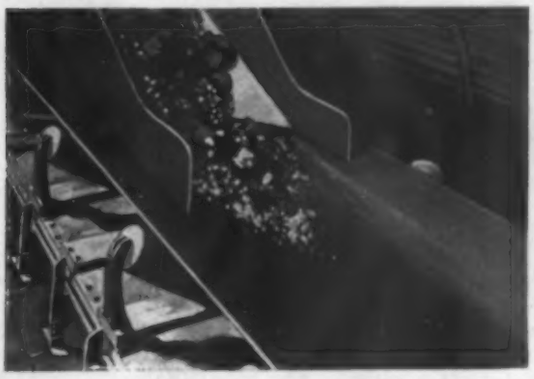
Fig. 2 represents the treating

HOW TO HELP YOUR PLANT IN THIS RUBBER CRISIS



THIS NEW 48-PAGE BOOKLET

is for managers, engineers and plant operating men. It shows how to conserve rubber through proper handling, installation and care by methods such as those illustrated below. Other subjects covered are molded goods, rubber covered rolls, rubber mountings, rubber printing materials, mats and matting, grinding wheels, electrical wires, cables and tapes. Free copies will be sent on request. Write the Mechanical Goods Division, Dept. 13, United States Rubber Company, at address below.



Protect Conveyor Belts by using "V"-shape notch in loading chute to distribute fine material first as cushion for heavy lumps.

Conserve Hose by proper choice and installation of couplings to assure application without injury to hose tube.

Extend Packing Life by examination of equipment, and reconditioning worn moving parts before repacking.

Preserve Rubber Linings from danger due to "changed over" operations, higher temperatures and possible damaging effects of substitute materials.

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue · Rockefeller Center · New York

In Canada Dominion Rubber Co. Ltd. Toronto, Ont.

Fig. 6—Pouring low-carbon rimming steel into a 24 x 54 x 72-inch mold

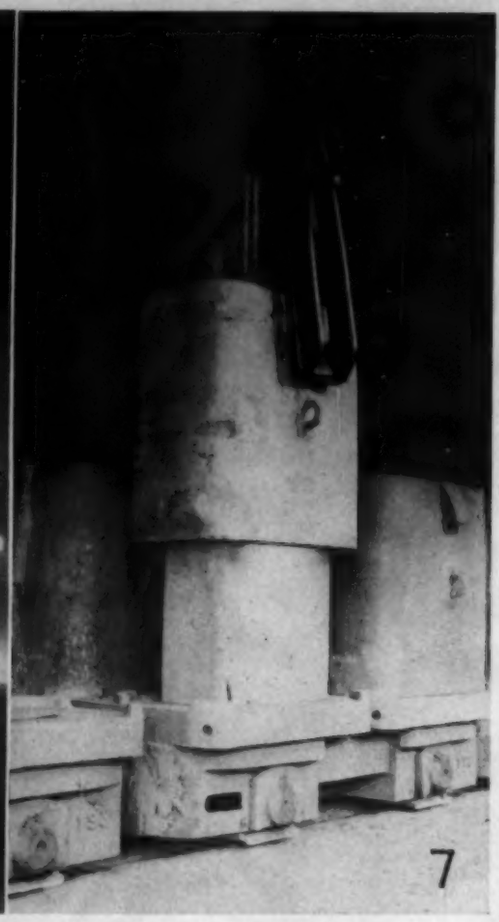


Fig. 7—Stripping a mold from a 24 x 54 x 72-inch ingot

iron shown in Figs. 1 and 4 after forging. This specimen was unetched and shows few fine inclusions. Fig. 3 represents material which received identical treatment but etched with 10 per cent Nital. Small gain structure is apparent.

Fig. 5 is a photomicrograph of the same material as Figs. 2 and 3 but the sample was obtained from a different section before forging and indicates a large grain. Chemical analysis of the slag treated sponge iron follows:

Element	Per Cent
Carbon	0.06
Manganese	0.18
Phosphorus	0.008
Sulphur	0.019
Silicon	0.020

The analysis of sponge iron used in this test follows:

Element	Per Cent
Carbon	0.88
Iron	85.44
Ferric oxide	4.64
Ferric oxide	Nil
Silica	6.08
Alumina	0.09
Calcium oxide	0.26
Magnesium oxide	0.05

This iron was produced by sintering flue dust with borings and turning under a reducing atmosphere and at sufficient temperature to reduce the Fe_2O_3 to Fe.

Another consideration is that of certain soaking pit cinder which analyzes:

Element	Per Cent
Carbon	1.29
Ferric oxide	60.00
Iron	35.00
Silica	3.53
Calcium oxide	1.10
Manganese oxide	0.59

With high iron (ore) heats this material will readily replace the ore and give a definite yield of metallic iron.

Another procedure is to treat borings and turnings in a like manner and thus reduce the carbon. Borings and turnings may be supplemented with soaking pit cinder which in many plants contain 0.40 per cent metallic iron plus iron oxide. Research on artificial scrap now is being conducted.

Mold practice is highly important with the higher grades of alloy or S.A.E. steels. In fact the most essential features in the production of alloy grades include mold designs and their care, hot topping, speed and temperature of pouring and the use of antipiping compounds. With the more common grades including rimming steel, production does not necessitate the extra cost of special molds and pouring conditions.

As stated, rimming heats should be hot enough to pour free of skull. When too hot, rejections increase and mold and stool life decrease. There is no advantage in using the big-end-up mold for rimming, ordinary grades or even low-carbon killed steels; such molds, however, should be considered for the higher types of alloy steels. Molds should be cleaned and sprayed, and used when warm. A fewer plants have a mold-warming oven for keeping molds at a definite temperature at all times. Some maintain that the temperature should range from 400 and 700 degrees Fahr.

Another feature of importance is mold coating or washes which include graphite, tar and aluminum. Many plants using a solution of aluminum have found that it provides a smooth mold wash surface, lessening the effect of splashing and scabs and effecting some reduction of gases. These mold washes consist primarily of a mixture of aluminum bronze powder, either polished or unpolished, and powdered graphite suitably incorporated in various liquid vehicles. One mixture uses 1 pound of aluminum powder and 3 pounds of powdered graphite in a vehicle consisting of molasses diluted with water. Molasses often is replaced with different oils or lacquers. Another

(*Please turn to Page* 120)

Fig. 8—Two bottom-cast ingots which were rolled into a finished plate of 35,000 pounds

IN every shop, every store, every home, there's a lot of junk, It is useless where it is, but mobilized, it can help win the war.

Old iron and steel, brass and copper, rubber, even burlap, paper and grease, are badly needed in huge quantities by American war industries.

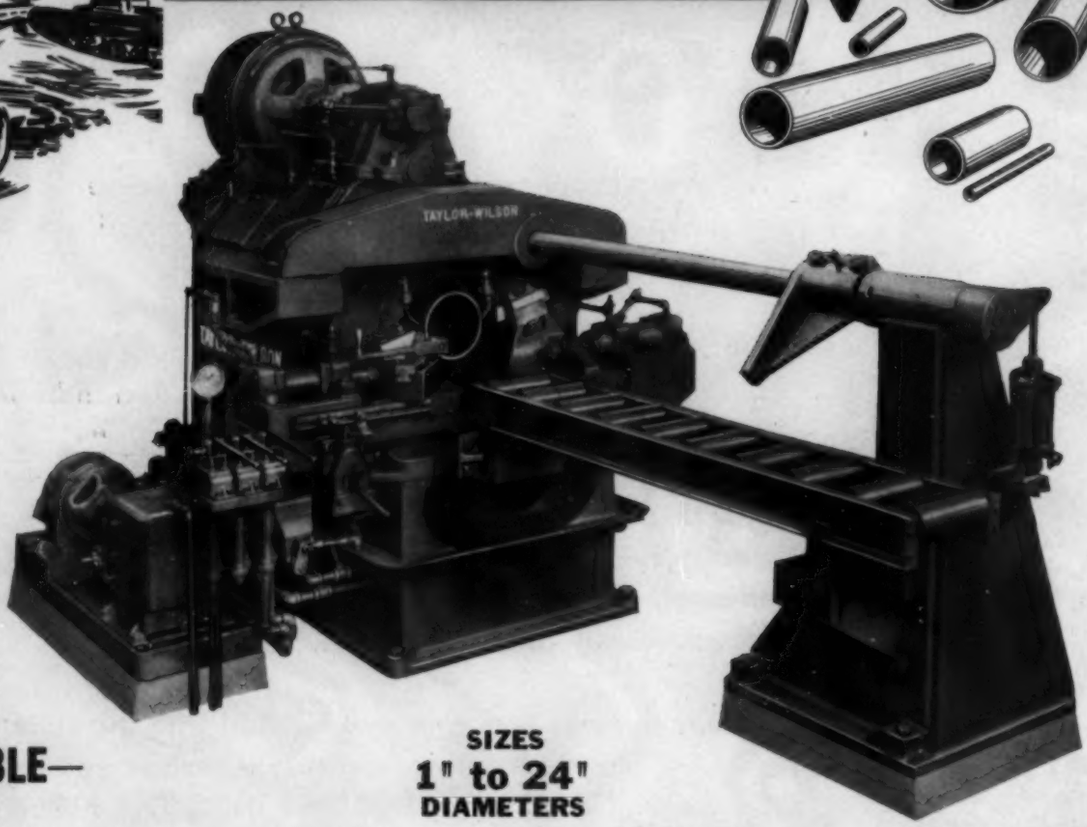
It is the immediate duty of every individual to do his part in the drive to mobilize scrap. Keep it flowing through regular scrap collection channels so it can be processed into war material.

This is the way that your cooperation with the all-out effort of the steel industry can insure earliest possible Victory. THROW YOUR SCRAP INTO THE FIGHT.

THE YOUNGSTOWN SHEET AND TUBE CO.

Youngstown, Ohio

⇨ TAYLOR-WILSON ⇦
Cutting-Off Machines
assure greater *Production*



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SIZES
1" to 24"
DIAMETERS

Taylor-Wilson Cutting-Off Machines will stand up under the gruelling service of high pressure war production. They are built for just such speed and accuracy in cutting off pipe or tubing for Coupling Stock, Roller Bearing Blanks, Bomb Blanks and other production items in set lengths. Sturdy, vibrationless, long-lasting, and a definite factor in increased output.

TAYLOR-WILSON MFG CO.
15 Thomson Ave., McKees Rocks, Pa.
PITTSBURGH DISTRICT

HANDLING CASTINGS Through the Cleaning Room

By J. M. MUNROE

IN A general rearrangement program to improve efficiency in the cleaning department of one of the gray iron foundries operated by the General Electric Co., and to meet increased production demands from 150 to 350 tons per week, it was necessary to modernize material handling methods. Speed up created by previously installed conveyor systems for molding, pouring and shakeout *(Please turn to page* 123)

From THE FOUNDRY

Fig. 1 (Top)—Fork truck about to deliver castings from shakeout to cooling room in steel box which can be stacked to allow more floor space. Fig. 2 (Above)—Delivering castings to manufacturing department. Fig. 3 (Below)—After drying the castings are transported to scales. Fig. 4 (Upper right)—Castings are delivered in same boxes from cooling room to tumbling barrel platforms. Castings are emptied from barrels into chutes leading to grinders and chippers. Fig. 5 (Right center)—Grinders and chippers place castings on conveyor which carries them to inspectors. Fig. 6 (Right)—From inspection conveyor takes castings through paint dip and oven dryer. Fig. 7 (Right below)—Castings are loaded on trailer by fork truck for shipment

PENNSALT CLEANER

with a real saving in cleaning cost

The huge turbine illustrated was made by a large electrical manufacturing company for a big public service company. Other types of turbines are made for use in units of our fighting fleet. All require the same kind of thorough cleaning job for the thousands of turbine blades.

The turbine blades, precision-made of stainless steel, require thorough, careful removal of heavy sulfonated oil before assembly. Blades and other parts, in this instance, were being cleaned by soaking in a boiling solution of trisodium phosphate (24 oz./gal.) and soda ash (4 oz./gal.), then hot rinsed and dried.

The Pennsalt representative, without changing the procedure, used only 5 oz./gallon of Pennsalt Cleaner with highly satisfactory results! The Pennsalt Cleaner stood up for 27 days of heavy service . . . doing not only a better job, but *making a real saving in cleaner costs as well!*

Pennsalt Cleaners are saving time and materials, reducing labor, cutting costs, helping speed needed production and improving products in scores of leading industries. In many types of metal manufacture they are removing and preventing the redepositing of dirt—grease, oil, emery dust, rouge, carbon smut, grit. They are efficiently cleaning a wide range of metals and alloys—stainless steel, carbon and alloy steels, copper, aluminum, zinc, nickel, nickel silver, Britannia metal, brass and bronze.

Pennsalt Cleaners produce the clean, smooth surface needed for Bonderizing, Parkerizing, enameling, painting, galvanizing or plating . . . on parts that are rolled, forged, stamped, drawn or cast.

What is *your* specific metal cleaning problem? The Pennsalt representative will be glad to analyze it and recommend one of the family of Pennsalt Cleaners—all of which have the dissolving and emulsifying action, the lasting power and cleaning qualities necessary for today's cleaning jobs. If you prefer, write fully to our Pennsalt Cleaner Division, Dept. S.

PENNSYLVANIA SALT MANUFACTURING COMPANY

Chemicals

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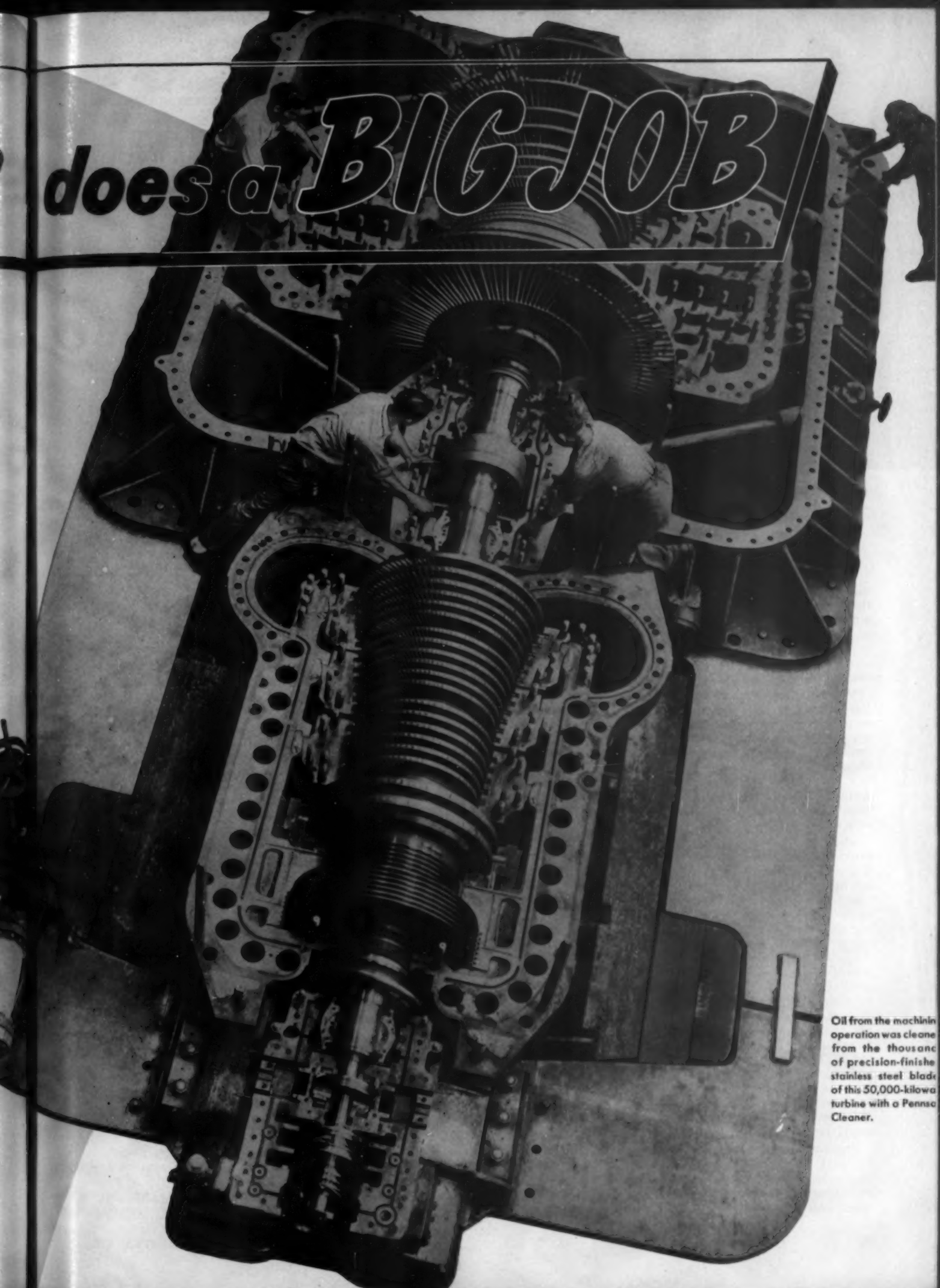
does a BIG JOB



Oil from the machinin
operation was cleane
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of precision-finishe
stainless steel blad
of this 50,000-kilowa
turbine with a Pennsa
Cleaner.

An extremely wide range of welding operations can benefit from use of larger electrodes, higher currents and correspondingly faster welding

Case Histories Show

FASTER WELDING

.... does result from use of larger electrodes

(Section 14 in a Series on How To Get the Most from Arc Welding)

By E. W. P. SMITH
Consulting Engineer
Lincoln Electric Co.
Cleveland

MANY authorities on arc welding have expounded on the benefits that result from use of larger diameter electrodes. In fact, Section 13 of this series (STEEL, July 6, 1942, p. 90) was devoted to an explanation of the factors that make these benefits possible.

However, many users of arc welding processes still appear to need convincing for many continue to use electrodes of a smaller size than necessary, thereby not only slowing up their own production but taking up the time of skilled welding operators whose time should be utilized with 100 per cent effectiveness.

Thus the following instances, detailing actual case histories of benefits that are being obtained should be of exceptional interest at this time, for they point the way to more efficient utilization of welding skill NOW when every facility for production is so important.

In Section 13 of this series it was pointed out that welding work which now takes eight hours could be done in six by simply employing ¼-inch diameter electrodes in place of 3/16-inch. In addition, it was shown how 25,000 welding operators would be made immediately available for other or additional welding work if a size larger electrode were adopted by only half the war-production welders on just half of the work now being welded.

Stevens Metal Products Co., Niles, O., says, "Would like to advise that the most outstanding example we can offer on the use of larger size electrodes is on one of our products where we are making a fillet weld joining 16-gage to ¼-inch steel We formerly used ⅛-inch diameter rod at a current of 90 amperes and welding speed of 7 inches per minute. Changing to 5/32-inch electrodes, the current was increased to 170 amperes and the welding speed to 16 inches per minute, effecting a 50 per cent reduction in repair welding and an increase in production of completed units from 3⅓ to 9 per 8 hours."

St. Paul Structural Steel Co., St. Paul, relates, "Using a 5/32-inch electrode in three passes, we made about 72 inches of ¼-inch positioned fillet welds in approximately 90 minutes. Using a 5/16-inch electrode in one pass, we now make the same weld in approximately 30 minutes. We are saving about one hour per unit or about 45 man-hours per week on this one item."

Downington Iron Works, Downington, Pa., explains, "Recently we had an order on which the average time was 4 to 4½ hours using 5/32-inch and 7/32-inch electrode. On more recent orders for the same work, the time is between 3¼ and 3½ hours by use of 3/16-inch and ¼-inch rods. Results with the larger rod were quite satisfactory."

Electric Machinery Mfg. Co., Minneapolis, reveals, "Stator frames formerly welded in three passes in horizontal position with 3/16-inch electrode, now welded in single pass with ¼-inch electrode with saving of 43 per cent."

Clyde Iron Works, Duluth, says, "On some particular jobs on which we were able to check closely, the saving in time was apparently about 15 per cent."

Calvert Iron Works Inc., Atlanta, Ga., relates, "We believe we are saving 15 to 20 per cent in time by using heavier electrodes, practically 3/16-inch and ¼-inch. As we have a large volume of welding to be done, this is an important factor in our production."

Delta-Star Electric Co., Chicago, writes, "Our welding foreman estimates that by using the 5/32-inch rod instead of the ⅛-inch rod, he makes a saving of one-third in time."

Black, Sivalls & Bryson Inc., Oklahoma City, Okla., points out, "The savings for the 5/16-inch rod over the 5/32-inch rod, on cost of metal deposited is about 50 per cent. Not considering overhead with 100 per cent operative factor, these costs vary from 46 cents per pound for 5/32-inch rod, 40 cents per pound for the 3/16-inch rod, 26 cents per pound for the ¼-inch rod and 22 cents per pound for the 5/16-inch electrodes."

There is said to be a widespread movement in war plants toward the larger electrode sizes. Many customers have already made the change and countless others are studying their production welding operations to adopt the larger sizes wherever possible.

Booklet Describes How To Prevent Welding Fires

"Preventing Cutting and Welding Fires" is the title of a booklet recently released by the National Fire Protection Association, 60 Batterymarch street, Boston. It relates how fires may start in using cutting and welding equipment and how to prevent such fires. It also illustrates examples of damages caused by fires from the sources mentioned.

Uses Solution To Clean Bosh Cooling System

Advantage recently was taken of the temporary shutdown of a large blast furnace to clean the bosh plates and hearth cooling system of accumulated deposits which were preventing the water from carrying away its full quota of heat from the lining. The procedure, as explained in the May-June issue of *Oakite News Service*, follows:

The first step was to pump a hot Oakite solution through the system to loosen a heavy slime. Then followed a pressure fresh water rinse which flushed out all loosened matter. Descaling then was undertaken with a solution of Oakite compound No. 32 which is designed to provide effective rust and scale removal. This was run into the system and allowed to soak until periodic titration of solution strength indicated all of the scale had been removed.

HOW YOUR ADVERTISING CAN HELP WIN THE WAR

Free Manual tells HOW

90 PAGES OF PRACTICAL HELP Demonstrates, by example, how your advertising, too, can help fight this war; help customers; help build a sound foundation for future business.

WANT FACTS? No chronicle of theories and opinions, this. "A Guide to Effective War-Time Advertising" is a factual report based upon the testimony of business leaders who have found ways to make their advertising *helpful* to their customers and prospects at a time when help is so desperately needed. It shows, too, how "oversold" companies now use "service advertising": how they do as the business paper editors do . . . *use their space to transmit important information from where it is to where it is needed.*

4,000 ordered by May 1
Get yours before they're all gone!

Useful Advertising Needs No Defenders!

We have to use
EVERYTHING WE'VE GOT
to win this war!

Good business papers are multi-purpose carriers that can convey important messages quickly, accurately, economically, to special groups of men with kindred war-time problems.

America, the world's greatest user of these vehicles of communication, has a powerful tool to use against the Axis.

By making the best possible use of business papers, now, we can strike a blow that will be felt across both oceans. "A Guide to Effective War-Time Advertising" will help you do this. One copy is yours for the asking . . . if you'll ask before they're all gone.

After you read this "Guide," you will have a new concept of what advertising can do to help America's war effort and to help your company solve its customer-relations problems, present and future. *And you will know what GOOD "institutional" advertising is!*

The "Guide" features advertisements that show some recognition of the conditions which today have *increased* rather than lessened the need for making business paper advertising *useful, informative* and *specific!* This "Guide," while comprehensive in itself, is only our introduction to a collection of case studies that will constitute a veritable WAR ALBUM. Send for it now and you'll receive additional up-to-the-minute case studies, free, as fast as they're produced.

TWO SUPPLEMENTS NOW INCLUDED!

In the first one a company head tells why his organization uses FOUR separate business paper advertising campaigns *as tools of management* to help solve difficult customer-relations problems under "sold out" conditions.

The second Supplement is Part One of a continuing study of dealers' war-time problems. It reports what distributive people are up against today and illustrates how some consumer goods manufacturers are using dealer paper advertising to speed useful suggestions and practical information that helps solve their mutual problems.

ABP

THE ASSOCIATED BUSINESS PAPERS

A national association of business publications devoted to increasing their usefulness to their subscribers and helping advertisers get a bigger return on their investment.

FREE

ASSOCIATED BUSINESS PAPERS,
Dep't. 2764, 369 Lexington Avenue, New York City
Please send, without obligation, my free copy of ABP's latest aid to advertisers, "A Guide to Effective War-time Advertising," including the supplements.

NAME _____

POSITION _____

COMPANY _____

STREET _____ CITY & STATE _____

CASTINGS ARE PAINTED BEFORE MACHINING

- ★ to speed finishing
- ★ to reduce overhead costs
- ★ to eliminate sand and dust
- ★ to reduce damage to castings

CASTINGS are painted when they come from the foundry and before they enter the machine shop at American Type Founders Inc., Elizabeth, N. J. This greatly increases the speed of finishing the printing equipment made by this company since it eliminates the difficulties of painting assembled parts and the need for carefully masking machined surfaces during finishing operations.

With the finishing department at the head of the production line, finishing is checked off as a cause of bottlenecks. A reduction in overhead in the finishing room by a ratio of 4 to 1 or 75 per cent, which shows up in the final analysis as a saving of $25 per unit, is also reported.

Considerable experimenting with various types of finishes and finishing methods was carried on to find a finish which was easy to apply, covered most surface irregularities present in castings and sheet metal parts and which was very durable—durable enough to withstand successive machining operations and assembly without requiring touching up. The wrinkle finish produced by New Wrinkle Inc., Dayton, O., and applied by spray gun was selected.

Castings Inspected

As American Type Founders Inc. does not maintain a foundry or metal stamping department, all castings and sheet metal parts are obtained from outside sources. Quality castings free from excessive blow holes and other surface irregularities are specified, and each casting is given a quick inspection when it is received to determine if some minor patching may be desirable. Rusty castings are given a light scraping with steel wool. Beyond this, the only prefinishing operation is snagging. No provision for degreasing is made as the castings are delivered comparatively free from shop dirt and grease.

Actual finishing begins as the castings or sheet metal parts are placed on a large work table and rolled into the spray booth. Here, using either black or machine-tool gray wrinkle finish, all surfaces, inside and out, are given one all-

Fig. 1. (Top)—Spray finishing rough castings preparatory to machining

Fig. 2. (Center)—Entire table is moved into electric oven heated to 250 degrees Fahr. Castings require 1½ to 2 hours to bake out, while sheet metal parts require 45 minutes

Fig. 3. (Bottom)—Finished castings ready for machining

Fig. 4. (Right)—This one-piece press base being machined is the largest casting used at American Type Founders Inc.

THE OSTER NO. 601 "RAPIDUCTION" LATHE

Speeds Production of 20mm, 37mm, 40mm Shells

Shell manufacturers were quick to recognize the advantages of the Oster No. 601 "RAPIDUCTION" Lathe.

SIMPLIFIED design; quick adaptability to a wide range of tooling set-ups and operations; availability with optional six position turret or plain saddle and tool holder; optional worm drive or direct drive; and many other features of optional or extra equipment make the Oster No. 601 ideal for manufacturers of 20mm, 37mm, and 40mm shells.

Quicker training of new operators is a big advantage of the No. 601 "RAPIDUCTION" Lathe. Manual operation of the six position turret eliminates the highly skilled set-up work required on the more complicated automatics.

Price? The No. 601 "RAPIDUCTION" (without tools) costs less than $2000 which includes the complete machine with either DIRECT or WORM drive; coolant pump; sheaves and belts; automatic push-out collet chuck; chuck with master collet but less all pads; with ratchet type bar feed; lever feed cross slide; six station manually indexed turret; two speed 1800/3600 R. P. M. 3/4 H. P. constant torque, 220, 440, or 500 Volt, 3 phase, 60 cycle motor, manual speed control and electric brake.

• • • • • •

Complete details including tooling set-ups, operations, and production estimates on 20mm, 37mm, and 40mm projectiles will be furnished promptly to qualified manufacturers.

OSTER

Let's GO!

THE OSTER MFG. CO. • 2037 East 61st St., Cleveland, Ohio

Rush, by return mail ..... copies of Catalog No. 27-A which contains full description and detailed illustrations of No. 601 Turret Lathe.

NAME .....

ADDRESS .....

CITY ..... STATE .....

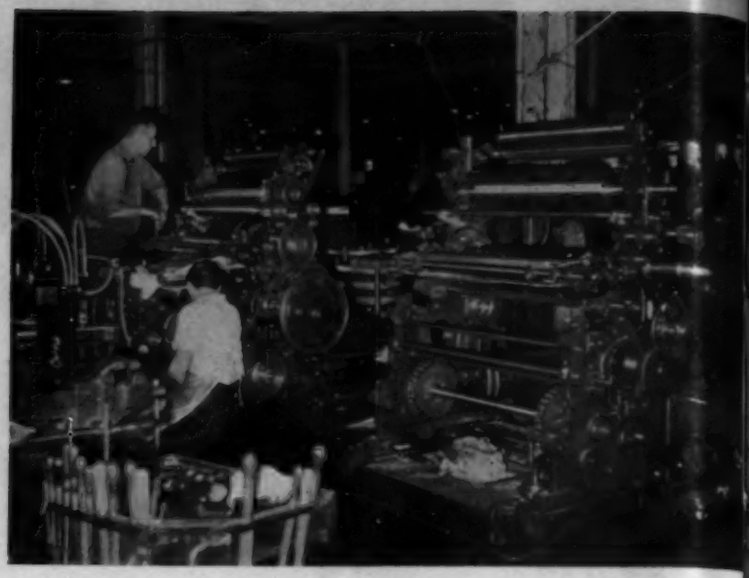


Fig. 5. (Upper left)—Machining a small finished casting

Fig. 6. (Right)—Assembled machines are carefully cleaned prior to final inspection

Fig. 7. (Left)—Final inspection of a completed Kelly Clipper press. Photos courtesy New Wrinkle Inc., Dayton, O.

concealing coat as shown in Fig. 1. After spraying, the work table is placed inside an electric oven and the parts baked at a temperature of 250 degrees Fahr. See Fig. 2.

Sheet metal parts bake out in 45 minutes, while the castings are dried in 1¼ to 2 hours. Thus the castings are completely finished and in the machine shop within 3 hours. Fig. 3 shows wrinkle-finished castings ready to be machined.

In the machine shop, the finished castings are processed just as if they were unfinished. Paint on areas adjacent to those being machined does not crack or chip, nor does clamping mar the finish.

Due to the fact that the paint coating seals any remaining sand and dust into the pores of the castings, the castings do not "shed" all the time they are being handled and machined. This results in a much cleaner shop.

Also, prepainting has been known to cut rejects of castings as much as 50 per cent, because the hard paint finish protects the surface and because the workers treat the finished castings more carefully since any carelessness in handling the castings shows up so prominently.

Fig. 4 shows the largest casting employed at this plant—a one-piece press base—being machined. A small casting is being machined in Fig. 5.

After machining, the various parts are held in stock or delivered directly to an assembly line. Upon the completion of a press, the original luster of the finish is restored by wiping it free from shop dirt and grease with a cleaning solution as shown in Fig. 6. No further finishing of touch-up of the paint is necessary after the initial application. Fig. 7 shows the final inspection of a completed Kelly Clipper press prior to shipment.

Revised File Standards List 14% Fewer Sizes

Division of Simplified Practice, National Bureau of Standards, Washington, reports that a revision of simplified practice recommendation R6-40, "Files and Rasps," was recently approved by the industry. It lists 324 American pattern files and rasps, or 14 per cent fewer sizes and styles than the 1940 edition. It omits 55 items which the Office of Production Management requested be discontinued for the duration of the emergency.

Inclusion, for the first time, of important data on dimensions, cuts, and tolerances, it is believed, will greatly enhance the efficacy of the simplification program. Heretofore the recommendation listed only the standard lengths of each type of file and rasp. The proposed revision supplements this with detailed dimensional standards covering width, thickness, range of file teeth per inch, the number of rasp-teeth per row and rows per inch, and tolerances.

Scope of the recommendation, according to the report, is enlarged to cover straight and curved-tooth milled files. Detailed standards for this type also are included.

The revision will be identified as simplified practice recommendation R6-42, "Files and Rasps (American Pattern, and Straight and Curved-Tooth Milled Files)," and will be effective from June 30, 1942. Mimeographed copies may be obtained free from the Division of Simplified Practice.

Develops Fireproof Oil Absorbent

A newly developed fireproof and skid-preventing oil absorbent is now being offered by Waverly Petroleum Products Co., Philadelphia. Called Speedi-Dri, it is a granular substance reported to have such tremendous affinity for oil and grease that its regular use draws old stains from floors—as well as removing new accumulations.

The company is offering the product especially for preventing accidents, reducing fire hazards and lowering insurance rates.

W-S Press Helps Machine Gunners Shoot Straight

At many a "somewhere in the U. S. A.", Watson-Stillman Straightening Presses are putting the finishing touches on machine gun barrels—more quickly, more accurately than ever before.

Meanwhile, scores of other plants are finding new uses for these versatile presses—straightening all kinds of rods, bars, tubes and structurals. For these units are available in many capacities—with and without movable work tables—equipped or not equipped with centers, rollers and other accessories. But, whatever the adaptation, all are conspicuous for their high speed operation, extremely sensitive control, and design refinements that only W-S hydraulic engineering experience and skill can provide.

Maybe this press or other W-S Presses like or unlike it can solve some of your problems. Bulletin 110-A, a condensed catalog, will answer that question. Secure it now.

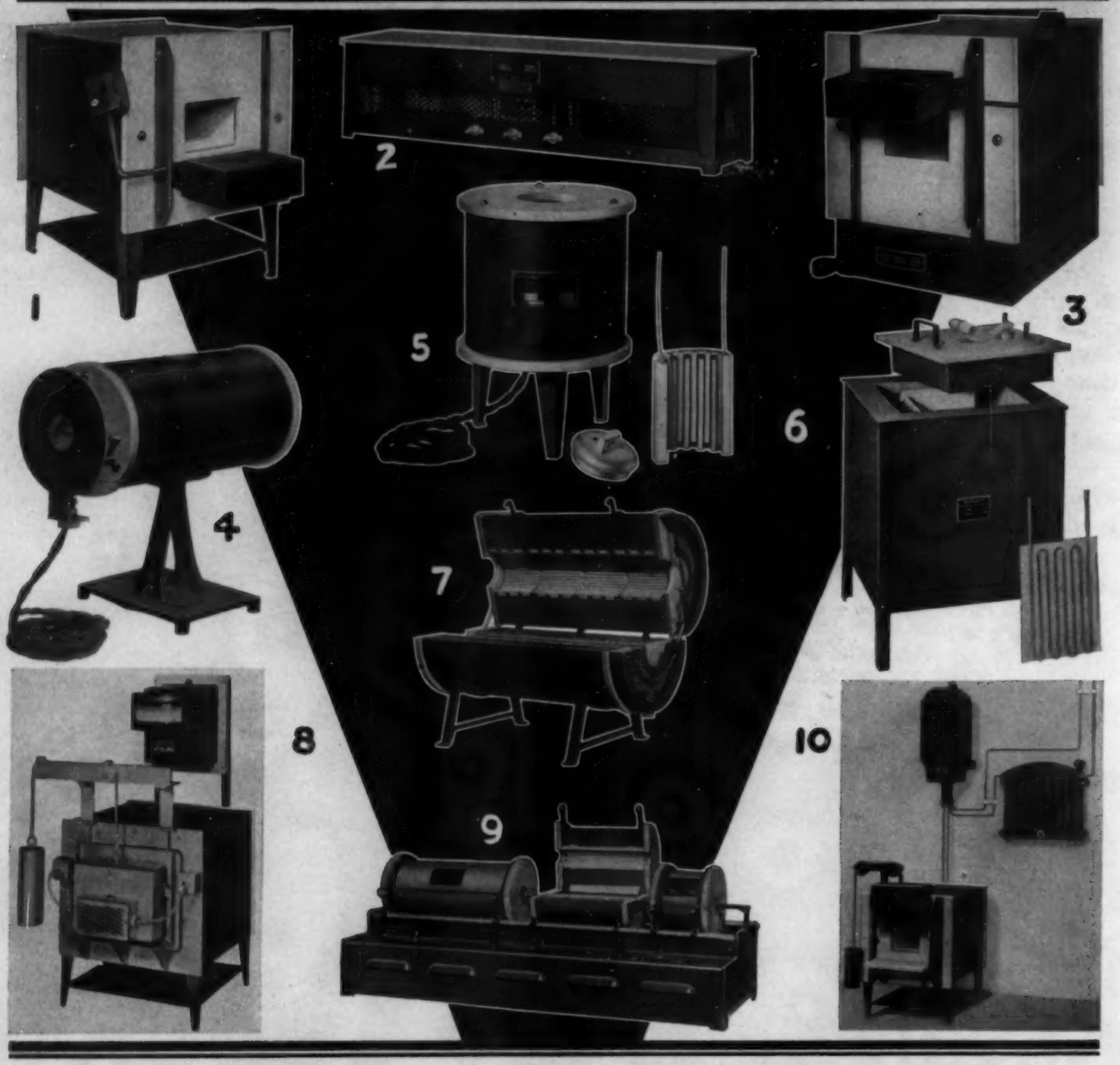
FREE! Hydraulic Handbook

Bulletin 120-A—12-page hydraulic engineer's handbook—yours for the asking. Capacities of Hydraulic Rams; Orifice Discharge of Water; Seamless Pipe Properties; Strengths of Materials; etc., etc. No advertising. Write The Watson-Stillman Co., Roselle, N. J.

WATSON-STILLMAN

Engineers and Manufacturers of Hydraulic Machinery and Equipment—Hydraulic Presses, Pumps and Jacks, Forged Steel Valves and Fittings

HEVI DUTY ELECTRIC LABORATORY FURNACES



1. Multiple Unit Muffle Furnaces—4 standard sizes—with detached rheostat.
2. Multiple Unit Hot Plates—3 heats—7 standard sizes.
3. Multiple Unit Muffle Furnaces with built-in rheostat—3 standard sizes.
4. Multiple Unit Solid Combustion Tube Furnace—10 standard sizes.
5. Multiple Unit Crucible Furnaces—5 standard sizes.
6. Hevi Duty Crucible Furnaces—3 standard sizes.
7. Multiple Unit Hinged Combustion Tube Furnaces—10 standard sizes.
8. Multiple Unit Muffle Furnaces—with controlling pyrometer.
9. Multiple Unit Organic Combustion Furnace.
10. Multiple Unit Muffle Furnaces with transformer and rheostat—2 standard sizes.

Ask your laboratory supply dealer or send for laboratory furnace bulletins

HEVI DUTY ELECTRIC COMPANY

LABORATORY FURNACES **MULTIPLE UNIT** ELECTRIC EXCLUSIVELY

TRADE MARK REG. U. S. PAT. OFF.

MILWAUKEE, WISCONSIN

New Insulating Glass Floats Like Cork

A new type of opaque glass that floats like cork and can be used as the buoyant element in life boats, rafts, preservers, and pontoon bridge supports is reported by Pittsburgh Corning Corp., Pittsburgh. Called Foamglas, it also is said to have valuable insulating qualities.

The glass weighs about 10 pounds per cubic foot—one fifteenth that of ordinary glass—and is odorless, fireproof and vermin proof. Because of its possibilities it is now under investigation by certain federal government agencies as an alternate material for such critical products as cork, balsa wood, cellular rubber and kapok, which are largely imported.

The product does not resemble any form of glass heretofore manufactured. It has a cellular structure containing myriad tiny air-tight cells which give it buoyancy and insulating properties. It can be sawed or drilled with ordinary tools. It is produced by firing ordinary glass which has been mixed with a small quantity of pure carbon.

At present, Armstrong Cork Co., Lancaster, Pa., is licensed to market this new material as a substitute for cork.

Develops New Alloy for Metal Cutting Tools

Haynes Stellite Co., Kokomo, Ind., announces development of a new Stellite cobalt-chromium-tungsten alloy for tools especially designed to increase speed of machining steel.

Tools of this alloy, known as Stellite 98M2, are reported to machine steel at even higher cutting speeds than company's Star J-Metal or 2400 tools, with longer life between grinds. With the new tools, heavy roughing cuts can be taken on steel turning jobs with coarse feeds—to get high rates of metal removal. Specific operations include turning, facing, boring, reaming, milling, grooving, cutting-off, forming, spot facing, core drilling and counterboring.

At present, tools of the new alloy are being offered in standard square and rectangular solid bits, and in 20 standard styles of welded-tip tools of various sizes. In addition, special tools, including solid bits or brazed-tip styles for grooving or forming special contours, can be made to users' specifications, according to the company.

The Upsetter

(*Concluded from Page* 79)

it is readily possible to heat the bar sufficiently to make a number of forgings without reheating. The actual number produced depends upon the rate of cooling of the bar stock. This is a familiar method of making ball bearing races. It is employed with upsetters rated 1½ inches and on up to the largest size made, depending on the size of the ring.

Another illustration of the same technique is shown in Fig. 9. This diagrams the steps in forging a radial engine cylinder. In the first operation the bar stock is upset to a button and the pierce started. In the second stage the pierce is further extended and so on until the bottom operation where the bar is punched out of the cylinder forging. The sequence of events is readily followed from a study of the diagram. Fig. 5 shows a characteristic design of upsetter. Closely allied to the upsetter in function and in its effect upon the metal is the forging press shown in Fig. 1. This particular machine is rated at 1600 tons. Fig. 2 shows a typical gear forging adapted to press production. In this instance there are three operations, specimens showing the various steps in the operation being seen at the front of the bolster, with the first on the right.

In action, bar stock, which has been previously cut to length and raised to forging heat, is placed in the die at the right and the barrelling operation performed. The second operation, shown at the left, further upsets the blank. In the third operation, center, the job is completed. Since this last step is the most severe and requires the greatest pressure of the three, the finish forging die is mounted in the center of the press die space to load the press uniformly. This particular setup requires a press of 1000 tons capacity.

Fig. 3 gives a vivid impression of the massive character of the elements of the press, the pitman in the illustration being cut from rolled steel plate.

Fig. 8—This series of parts shows the sequence of operations in forging the box end of an oil well sucker rod. Note the work starts with the rather long section of rod which is gathered and upset into the socket end in six stages. Ajax Mfg. Co. photo

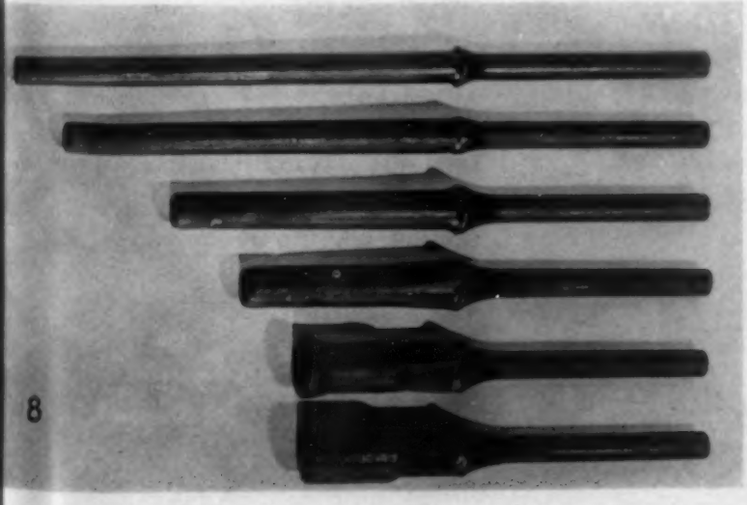


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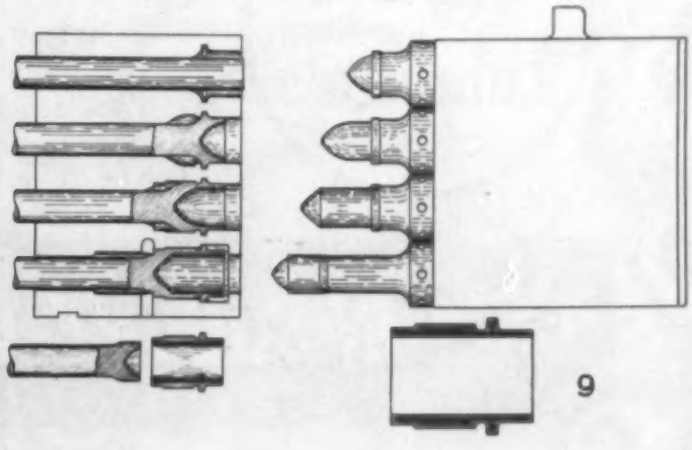
Fig. 9—Cylinders for radial aircraft engines are forged by a variation of the ring forging method shown in Fig. 4. But here the metal is flowed radially, rather than longitudinally. No metal is wasted, however, as the cropped bar starts through the sequence of forging operations for the next piece without further trimming. Lower right shows a section through forged cylinder with a finished section superimposed on it



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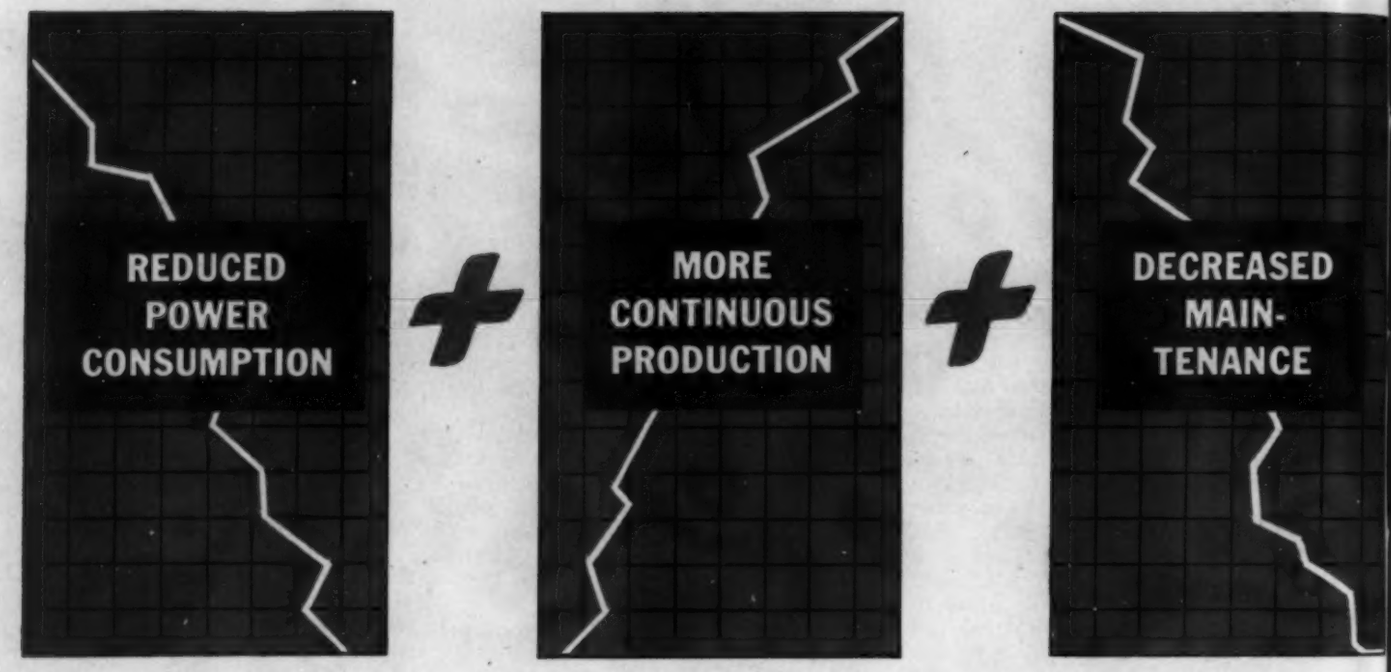
SOCONY-VACUUM'S FAMOUS LUBRICATION

Capacity



The "4-Factor" Story proved in Peacetime—Now vital in Wartime

GARGOYLE Lubricants

NEVER BEFORE IN U. S. A. HISTORY has there been such grim, absolute necessity for Correct Lubrication. It's a keystone in our Battle of Production. Without it no plant can achieve full efficiency.

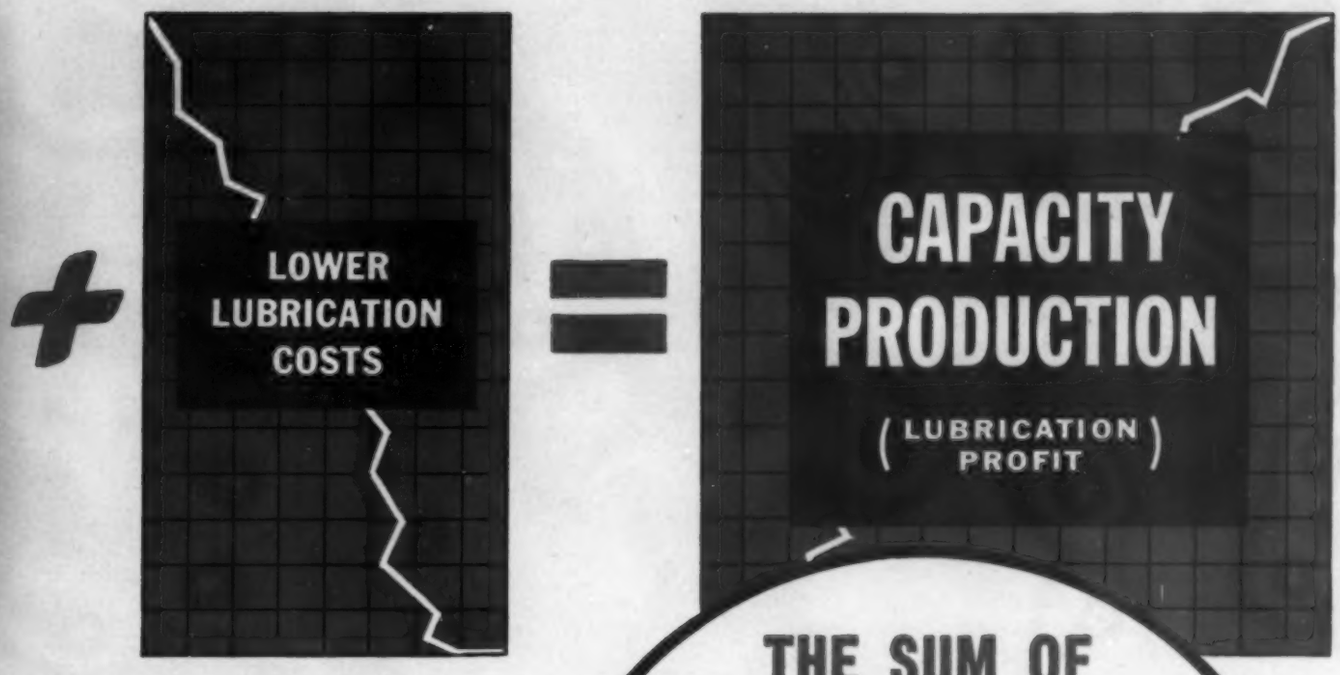
For years Socony-Vacuum—*the first to present and apply the principle of Correct Lubrication*—has been proving to management that it results in 4 savings which add up to a Lubrication Profit. Today, this Lubrication Profit pays off in Capacity Production!

If you are interested in results, talk this over with the Socony-Vacuum man. Backed by 76 years' experience, no one in the lubrication field is better equipped than he to give you the results you want!

CALL IN SOCONY-VACUUM FOR CORRECT

PROFIT NOW PAYS OFF IN...

Production!



Socony-Vacuum's 4-FACTOR STORY is a Famous guide for operating men throughout U.S.A. Industry

THE SUM OF THESE FOUR SAVINGS

4

1. REDUCED POWER CONSUMPTION
2. MORE CONTINUOUS PRODUCTION
3. DECREASED MAINTENANCE
4. LOWER LUBRICATION COSTS

=LUBRICATION PROFIT

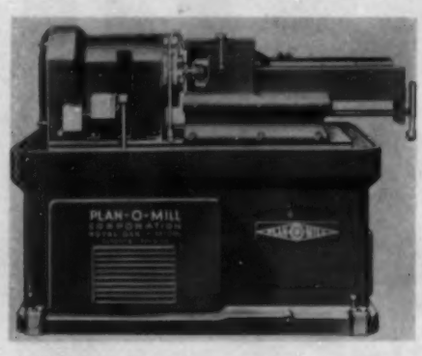
SOCONY-VACUUM OIL CO., INC. • Standard Oil of N. Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. • White Eagle Div. • Wadhams Div. • Southeastern Div. (Baltimore) Magnolia Petroleum Co. • General Petroleum Corp. of Calif.

LUBRICATION

INDUSTRIAL EQUIPMENT

Feed Control for Milling Machine

Plan-O-Mill Corp., Royal Oak, Mich., formerly the Gordon-R Co., announces the incorporation of a General Electric Thy-mo-trol feed control, built into its standard model 3 planetary milling machine. Use



of this control converts alternating current into direct current. This is said to provide an infinite and stepless range of feed, both into and around the work by regulating the flow of current to the feed motor.

According to the corporation, parts too cumbersome or irregular in shape for the conventional milling machine are milled speedily and accurately on the machine—since all motion is in the milling head. Equipped with the Thy-mo-trol, this machine can be used for internal and external, right or left hand, threading and form milling where rapid production, precision and high finish are required. It also is suited to many types of form milling.

Floor Truck Lock

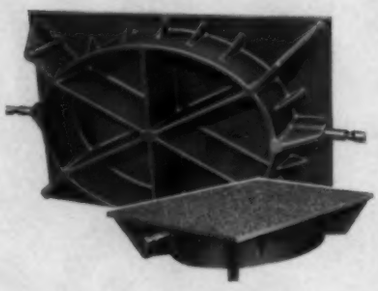
Bassick Co., Bridgeport, Conn., announces a floor truck lock said to keep floor trucks in place without brakes. Spring actuated, the device is locked or released by means of a foot pedal. The foot

lever is always in a fixed position, easily accessible. The heavy spring gives a constant and predetermined locking pressure, and also a range of action through which the locking pressure is effective. This compensates for variations in floor conditions and overall heights.

The steel cup mounting of the brake shoe is not held rigid but has a flexible joint so the locking surface of the brake shoe is in flat contact with floor surface. Almost 12 square inches of friction locking surface is presented by the device in contacting the floor. The lock is mounted underneath the truck and out of the way.

Surface Plate

Smith Tool Works, 832 North Sandusky avenue, Bucyrus, O., announces a new Master surface plate of special fine grain cast steel designed to eliminate distortion. Severe working tests have demonstrated it will maintain a constant accuracy over a long period of

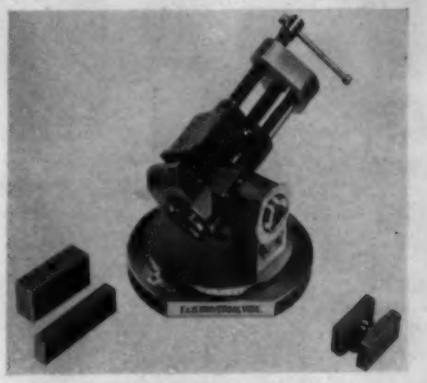


time. The plate is designed with a large elliptical rib reinforced with 6-point spider rib and supporting ribs to outer edges giving stiffness and rigidity.

Angle Machining Unit

F & H Mfg. Co., 6024 Ellery street, Detroit, has introduced an "angle machining package", designed to reduce materially the set-up time in the production of compound angles. It consists of three parts—the vise, with improved locking control, a grinding wheel angle dressing attachment and a unique swivel clamp for holding odd-shaped work pieces. The latter, called Equihold, consists of two friction plates joined together by ball and socket. It fits between the work piece and one jaw of the vise, being fastened to the latter, adapting itself to the angle of the piece.

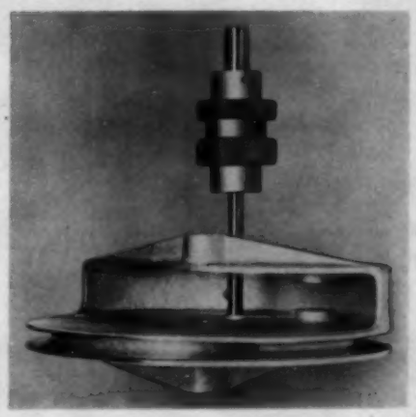
The vise is of all steel construction, precision built, with hardened and ground steel jaws. Extreme precision in producing any angle, vertical, horizontal or transverse, is said to result from the vernier dials, which are standard equipment. The vise is compact, being only 4¾ inches high, yet the jaws open to the standard width of 2¼ inches. A weight of 14 pounds makes the vise portable. The third item in the "angle machining package" is a grinding wheel dressing



attachment which fits into the vise, eliminating need for a separate angle wheel dresser. The dressing tool is held rigidly at the correct drag angle for best dressing results.

Burring Tool

Nobur Mfg. Co., 6156 Santa Monica boulevard, Hollywood, Calif., announces a new burring tool effective in removing burrs from inside edges of multi-walled parts. Simple in construction and operation, it

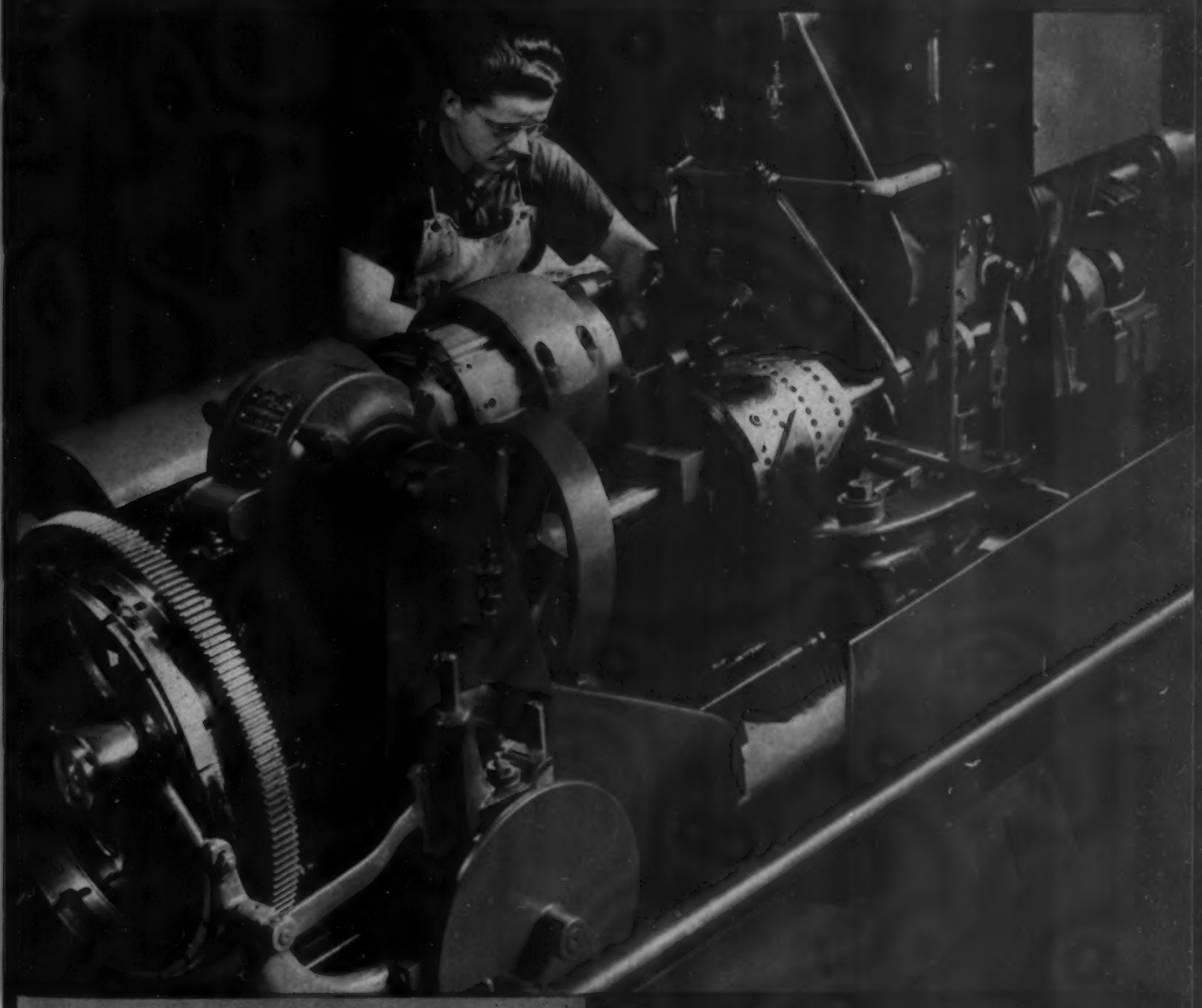


can be used in a drill press, lathe or other machine spindle in continuous motion while parts are fed to it as fast as the operator can handle them.

The tool consists of a cylindrical shaft which pilots in the hole to be de-burred—to one end of the shaft is fastened a knurled collar. This collar is a free-rolling ball bearing unit that can be grasped and held by the hand even while the shaft is rotating. By sliding the collar up or down, the burring blade can

Black & Decker SPEEDS PRODUCTION, CUTS COSTS, WITH CLEVELAND MODEL "A" *Single Spindle* AUTOMATICS

BLACK & DECKER



• With *small lots and short runs* constantly involved in their production of portable electric tools, The Black & Decker Manufacturing Company uses Cleveland *Single Spindle* Automatics to good purpose in avoiding "bottle-necks" in their fast-moving production schedule. • Fitted into production, as "bottle-necks" on hand-screw machines occur, Clevelands quickly produce the parts needed on time . . . *when time is short.* • In 3¼-inch up to 8-inch capacity, Model A is provided with a 4-speed motor drive, universal camming and variable tool feed. In 1 1/16-inch up to 2½-inch sizes constant speed drive is standard, but two-speed drive is optional at slight additional cost. Ask for information on the size of most immediate interest to you.

THE CLEVELAND AUTOMATIC MACHINE COMPANY
2269 ASHLAND ROAD, CLEVELAND, OHIO

Sales Offices at

Detroit, 540 New Center Bldg. • *Newark*, 702 American Insurance Bldg.
Chicago, 565 W. Washington Street • *Cincinnati*, 507 American Bldg.

CLEVELAND *Single Spindle* AUTOMATICS

Where + or − 2°F. CAN BE A SABOTEUR!

Men who build war plants not only talk about the weather — they *do something* about it. There is no other way out when a temperature change of 2°F. can throw precision instruments more than 1/1000th of an inch out of line! Air conditioning is the answer.

Many air conditioning ductwork systems are constructed of galvanized ARMCO Ingot Iron. Engineers specify this durable metal because it has the longest actual service record (36 years) of any low-cost iron or steel sheets. Yet with all its durability ARMCO Ingot Iron costs on the average only about 1c a pound more than ordinary galvanized metal.

Long service life is important in the construction of buildings too. That's why corrugated ARMCO Ingot Iron is being used for roofing and siding on so many new structures needed for army ordnance and arms production. Engineers are not losing sight of the post-war value of these emergency buildings.

If you are designing buildings or air conditioning systems for war production write for complete information about galvanized ARMCO Ingot Iron*. We'll give you proof of its long life and low maintenance cost. The American Rolling Mill Co., 2201 Curtis Street, Middletown, Ohio.

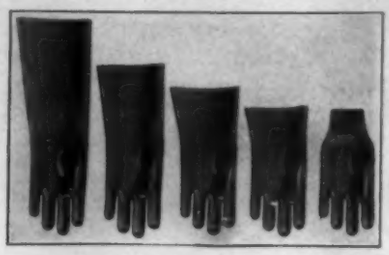
GALVANIZED ARMCO INGOT IRON

**For immediate painting and long paint life ask about galvanized ARMCO Ingot Iron PAINTGRIP sheets.*

be advanced into cutting position or withdrawn. The cutting blade of the tool is of special tool steel and can be easily and quickly removed for re-sharpening or replacing. The tool is being offered in 1/16-inch progressive sizes—from 3/16-inch to 1 inch.

Industrial Gloves

Edmont Mfg. Co., 555 Orange street, Coshocton, O., has introduced a new synthetic rubberized fabric glove said to be highly resistant to oils, greases, solvents, acids, caustics, corrosives and severe abrasives. It is lined with napped canton flannel and is available in knit wrist or gauntlet styles. Liquid proof, due to the new synthetic material, it is said to outlast other gloves two to four times.



Glass Floodlight

Lighting Division, General Electric Co., Schenectady, N. Y., has placed on the market a new L-49 glass floodlight combining the high reflectivity of silvered glass with unusual resistance to shock. Its construction eliminates use of vital materials needed for the war. Although the reflecting surface of the floodlight is entirely of glass, it is completely shatter-proof. Reflector is coated by electrolytically deposited metal which together with an overall backing of porcelain enamel is said to keep the glass from shattering even if it is broken by a severe blow. The reflector is joined to a metal socket housing which is sealed with a heat-resistant gasket and which acts as a preventive against the entrance of water. Door

glass and gasket fit solidly against the reflector. The floodlight utilizes 300 or 500-watt lamps.

Straightening Press

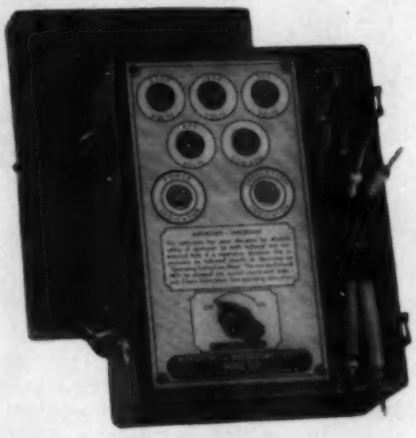
Watson-Stillman Co., Roselle, N. J., is offering an improved 50-ton press for finish straightening gun barrels. According to the company, it differs from former types in that it incorporates a positive stop adjustment controlled by a handwheel, as well as in the fact that the press is mounted on an angle base to facilitate sighting along barrels being

straightened. The press also is suitable for straightening structurals. It has a 12-inch opening, 10-inch gap and 9-inch stroke. Its table is 6 feet long by 11½ inches wide.

The ram diameter is 8 inches. Control is by a hand lever. Power is furnished by a 7½-horsepower motor, operating the press through rotary van type pumps.

Breakdown Tester

Superior Instruments Co., 227 Fulton street, New York, has introduced a model 520 insulation and breakdown tester which features a sensitive charger indicator that



lights up to indicate leakage up to 1000 Megohms, (1,000,000,000 Ohms). When using the instrument it is only necessary to connect the two test leads to the cir-

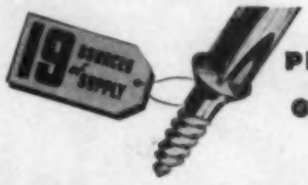
Rapid Driving • No Slipping • Better Holding = 50% Less Assembly Time with Phillips Screws

Here's the formula for doubling fastening schedules: Replace slow-driving slotted screws and awkward hand-driving methods with Phillips Recessed Head Screws and pneumatic or electric drivers. Phillips screw and driver fit as one, making easier, fumble-free driving with no danger of driver slipping from recess to mar surface or cause injuries.

Slotted screw bottlenecks — crooked screws — split heads — burrs — all the slotted screw headaches that waste so much time and effort are eliminated. Work goes smoothly when you replace snail-paced slotted screws with lightning-fast Phillips screws.

You'll discover you get 2 hours work done in one — with a 50% saving in *cost* as well.

Contact companies listed below for further facts.



PHILLIPS RECESSED HEAD SCREWS GIVE YOU 2 for 1 (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS • SCREWS WITH LOCK WASHERS

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N.H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N.Y.
Pawtucket Screw Co., Pawtucket, R.I.
Pheoll Manufacturing Co., Chicago, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N.H.

*

—and thanks for keeping that promise!

Honest delivery promises are mighty important these days — when time counts for so much in war production — when schedules *must* be met! P&H knows this. And P&H has done something about it!

*Despite the largest volumes in our 58-year history, we're beating our schedules — to help vital war plants beat *their's* by quoting honest delivery dates.

To save time, effort — and make the most of man power — handle it "thru the air" with P&H Hoists. Built in capacities up to 15 tons, P&H Hevi-Lift Hoists are the proper solution to hundreds of materials handling problems. P&H hoist engineers are ready to help you.

• Awarded the Navy "E" for excellence in war production, P&H displays it also as a pledge of future effort.

P&H HEVI-LIFT HOISTS

General Offices: 4411 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

cuit, appliance or motor to be tested, then throw the switch. The unit also will indicate "shorts" and "opens" and as a safety feature includes a jewelled pilot lamp on the front panel which indicates when high voltage is on. It is housed in a portable carrying case with compartment for test leads. It operates on any 90 to 125-volt 60-cycle alternating-current line.

Small Turret Lathe

South Bend Lathe Works, Department 6S, South Bend, Ind., has introduced a new bench model turret lathe which features rapid production to close tolerances—on chucking operations or bar work. It has a 10-inch swing over the bed and saddle wings, 1 3/8-inch hole through the headstock spindle and 1-inch collet capacity. It also is adapted to second operation work.

The handlever operated bed turret indexes automatically in action

and has an adjustable stop for each of the six turret faces. The lathe is equipped with both a compound-rest cross slide and a handlever cross slide, these being interchangeable. The latter is furnished with front and rear tool blocks providing three tool positions.

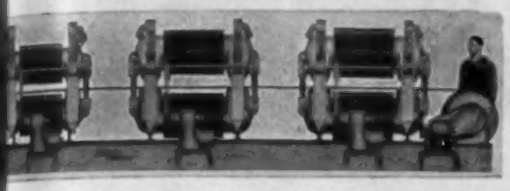
A quick-change gear box supplies 48 longitudinal power feeds for the universal carriage, 48 power cross feeds for the compound-rest cross slide and 48 thread cutting feeds, 4 to 224 per inch. The underneath motor drive and back gears deliver 12 spindle speeds, from 97 to 700 revolutions per minute.

Magnetic Separator

Stearns Magnetic Mfg. Co., Milwaukee, has introduced a redesigned type R Wetherill cross-belt magnetic separator which features a lighter yet strong framework and modernistic appearance. Elimination of much of its heavy framework which formerly supported the coils has been accomplished without weaken-

ing the structural advantages of the unit.

Material is fed in the unit by a special feeding device upon the main belt and the magnetic portions being intercepted and carried to special chutes on the side. Separators are offered in many and varied combinations, having one or



more magnets, the windings of which are powerful, being separately controlled by rheostat. Ammeters in circuit with the windings provide readings, and make possible the regulation of each magnet by the resistance method to a definite power or magnetic force. Unit illustrated is a 3-magnet type.

Air-Motor Jack

Duff-Norton Mfg. Co., 2709 Preble avenue, Pittsburgh, has introduced an improved rotary air motor jack in which greater power, and more speed has been added. Its new motor is said to operate 25 per cent faster with ordinary shop air pressures—yet consumes less air, and is used for both raising and lowering.

The jack features an automatic shutoff which cuts the motor off

when the lifting standard reaches the safe limit of its raised or lowered position. A filter in the air hose assures clean air to the motor, and it is easily removed for cleaning. Rubber-tired, roller bearing wheels allow easy spotting. Jacks are being offered from 20 to 100-ton models.

Turning Machine

Snyder Tool & Engineering Co., 3400 East Lafayette street, Detroit, announces a heavy-duty double-end hydraulic turning machine reported capable of increasing production 65 per cent. One of its features is the hydraulic feed operated from

ROEBLING Wires
ROUND . . . FLAT . . . SHAPED
A FEW WIRES TYPICAL OF ROEBLING'S BROAD SPECIALTY PRODUCTION
FOR PARTS THAT Must not FAIL!
FLAT WIRE TO SPECIFICATIONS
SHAPED WIRE
HIGH CARBON WIRE FOR MACHINE GUN RIVETS

FOR FAST OFFENSE PRODUCTION of parts that *must not fail*, turn to Roebling for the right round, flat, or shaped wire stock. This high carbon wire for machine gun rivets, made by Roebling's special process, for example, shows our ability to meet unusual and exacting metallurgical and physical specifications, and to produce to standards of uniformity that approach perfection.

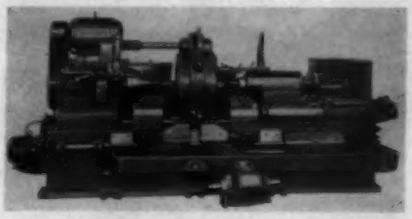
Whether your specifications call for close dimensions, unusual shapes, uniform temper or special finish, remember that Roebling has built a reputation solving wire problems, and has the experience and facilities to solve yours. Prompt action on war orders.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities

a hydraulic power unit at the rear of the machine. This unit furnishes power to both front and rear tool slides as well as to the tailstock. Tailstock movement is controlled by a hand-operated valve and facilitates loading and unloading of work by pushing the piece forward into the center drive fixture.

The right-hand tool bracket, when swung into clearance position, provides a loading platform in line with the locating surface in the center drive. When the part is loaded and pushed into place between centers, it is clamped manually and the tailstock locked in place, ready for the first of the two turning operations. A further function of the hydraulic system is the actuating of the front and rear tool slides. Each front tool slide has its own hydraulic cylinder and the slides are racked together to permit a single hydraulic and electrical control. Likewise, the rear tool slides are kept synchronized by a pair of hydraulically actuated cam plates which move the slides through a rapid advance and feed cycle.

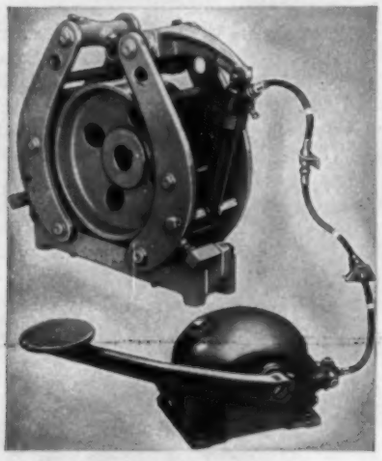
Control for entire machine consists of a start and stop push button, a cycle-start push button and an emergency return, these being mounted on the center drive. The drive is carried on a pair of extra-large bearings and is equipped with an oil reservoir. Base of the machine is welded steel, well ribbed for rigidity, and the machine itself is constructed with heavy cross sections in all vital parts. The base functions as a large chip trough



and coolant container. Coolant is circulated to the cutting tools by a motorized pump at the rear of the machine.

Hydraulic Brakes

Harnischfeger Corp., Milwaukee, announces all P&H overhead traveling cranes effective immediately, will be furnished with a new type hydraulic brake. The unit embodies features pointing to increased efficiency and easy maintenance under all working conditions. It eliminates need of a separate supply tank, the



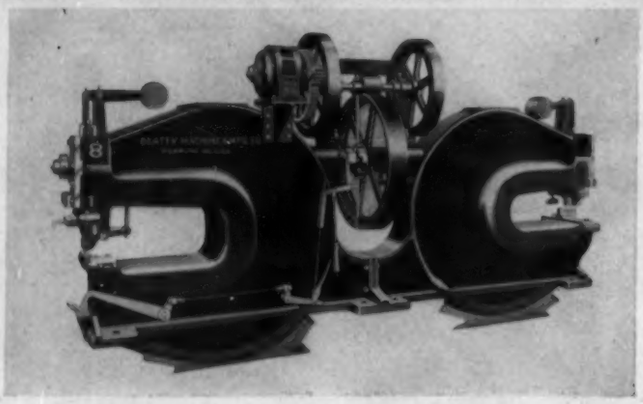
fluid now being placed in the foot-operated master cylinder.

Other features are hard bronze bushings which permit extremely close fits; alloy cast steel iron wheel for greater resistance to wear and scoring; and swing-open jaws which allow quick removal of wheel without disturbing brake adjustment. Wear adjustments are made by turning two nuts. Wagner-Lockheed hydraulic equipment is used.

Transformer

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a new standard type CT indoor current transformer equipped with Hipersil core. It is available in current ratings from 10 to 800 amperes primary and 5 amperes secondary

"SIAMESE TWINS" Doing Double Duty



This BEATTY Double End Punch conserves floor space, reduces man power required for operation. Machines are timed to punch alternately. Machine is available with plain table or architectural type table at either or both ends . . . interchangeable tools provide punching or shearing on either or both ends. Available in a full range of throat depths. Widely used in the shipbuilding, tank, railroad, and aircraft industries. This model is one of a complete line of Detail Punches, Single End Punches and Shears, Beam Punches, Flush Front Shears, Horizontal Punches and Heavy Duty Plate Shears. If you have a heavy metal fabrication problem, call in a Beatty engineer.

BEFORE YOU BUY SEE BEATTY FIRST

Illustrating, left to right: 1. Beatty Hydraulic Brake and Flanging Machine. 2. Self-Contained Hydraulic Press. 3. Extruding Press. All are available in a complete range of sizes. Write for bulletins.

BEATTY MACHINE & MFG. COMPANY HAMMOND, INDIANA

with voltage ratings of 5, 8.7 and 15 kilovolts.

Definite primary terminal dimensions of the transformer are set for the distance between centers of the outside terminal holes, size of

the hole, size of the slot, the distance from the base to the under side of the terminal and the overall height from the mounting base to the top of the transformer. Consequently, any standard type CT transformer is interchangeable with any other in its voltage class.

Form Grinder

Wickman Corp., 15533 Woodrow Wilson avenue, Detroit, is offering a new optical form grinder capable of finish grinding to a high degree of accuracy any flat or circular form tools, punches and dies, profile gages, templets and other regularly or irregularly shaped parts. It is particularly adaptable to the grinding of tungsten carbide.

A Sheffield Corp. built machine, it actually is a combination of a full universal tool grinder with a pantograph controlled optical checking instrument. The grinding head carries a wheel slide which moves up and down at 80 strokes per minute across the contour of the part to be ground. Work is clamped to the table and its position controlled and set by compound slides.

Preliminary to the grinding operation a 50:1 layout is prepared in the drafting room on any paper of non-deforming quality. It is fastened to the layout plat located above the machine. This plat is adjustable and may be locked so its position will be unchanged while grinding is in progress. In conjunction with the layout plat is a 50:1 pantograph. A 30-power microscope is carried on the short arm. The long arm of the pantograph carries a pointer which the operator moves from point to point along the line of the layout. The microscope is arranged with rotating cross hairs, the intersection of which corresponds to the position of the pointer on the long pantograph arm. As the operator moves the pantograph pointer, the intersection of the cross hairs moves correspondingly at the 50:1 reduction.

The wheel head assembly can be adjusted to any desired position or angle by three radial slides, and its path across the contour of the work is manually determined by lateral and longitudinal cross slides. The grinding wheel is fed to the point established by the intersection of the cross hairs, and its exact position is observed through the microscope. The 2-inch stroke of the wheel permits a number of thin pieces to be stacked together. The machine will grind a form 5¾ inches in length and 2⅝ inches in

WHEN THE BIG TEST COMES

these nuts hold tight

Bolted connections on military airplanes call for lock nuts that hold with a grip which is positive and yet resilient . . . a grip that withstands the complex vibrations, the stresses, and the shocks, of high-speed maneuvering . . . a grip that protects the ships and the men who fly in them.

Evidence that Elastic Stop Nuts meet these all-important requirements is found in the fact that they are used for vital structural and equipment fastenings on **every** military airplane built in the Western Hemisphere.

There are more Elastic Stop Nuts on American airplanes, tanks, and other war equipment, than all other lock nuts combined.

WITH THE RED LOCKING COLLAR . . . SYMBOL OF SECURITY

ELASTIC STOP NUTS may be the solution to *your* fastening problems. Sample nuts, for testing, will be furnished without cost or obligation.

» Write for folder explaining the Elastic Stop self-locking principle.

ELASTIC STOP NUT CORPORATION · 2367 VAUXHALL ROAD · UNION, N. J.

Elastic Stop SELF-LOCKING NUTS AND AIRCRAFT FITTINGS

HELP AMERICA · KEEP 'EM FLYING

depth in parts 2 inches thick. All necessary equipment for grinding flat work—including electrical equipment for regular alternating current—is furnished as standard. A wheel dresser capable of dressing straight faces to any required angle also is provided. The machine is provided with upper and lower lights to illuminate the work.

Jib Crane Supports Welding Equipment

Progressive Welder Co., 3050 East Outer drive, Detroit, announces development of a standardized flexible installation for production spot welding in assembly of light-gage aircraft steels, including stainless. Incorporating a number of features, refrigerated electrodes, variable throat-depth and welding transformer built right into a lightweight welding gun, it features a jib crane with 6-foot trolley-type arm.

Being completely self-contained, the equipment is easy to install and provides a wide area over which the equipment can be used, according to the company. The gun hanger is so designed that the gun may be swiveled 360 degrees in any plane. In spite of the built-in welding transformer, the gun is light in weight and is spring counterbalanced. It may be adjusted for throat depth by changing the electrode arms. It normally carries relatively small diameter electrodes.

The refrigerating unit, which

makes possible use of small-diameter electrodes, is mounted on top of the jib crane. It circulates brine through the electrodes, maintaining the latter at below-freezing temperatures. Adjacent to the control button on the welding gun is a toggle lever which retracts the electrodes to clear obstructions.

FIDELITY SINFRA *Triple-Head* WIRE COVERING MACHINE . . . *for triple covering of wire*

The FIDELITY Sinfra Triple-Head Wire Covering Machine—three knitting heads in series—knits three cotton coverings on wire up to #6 gauge—1200 to 1500 feet per hour—speeds production—low power consumption.

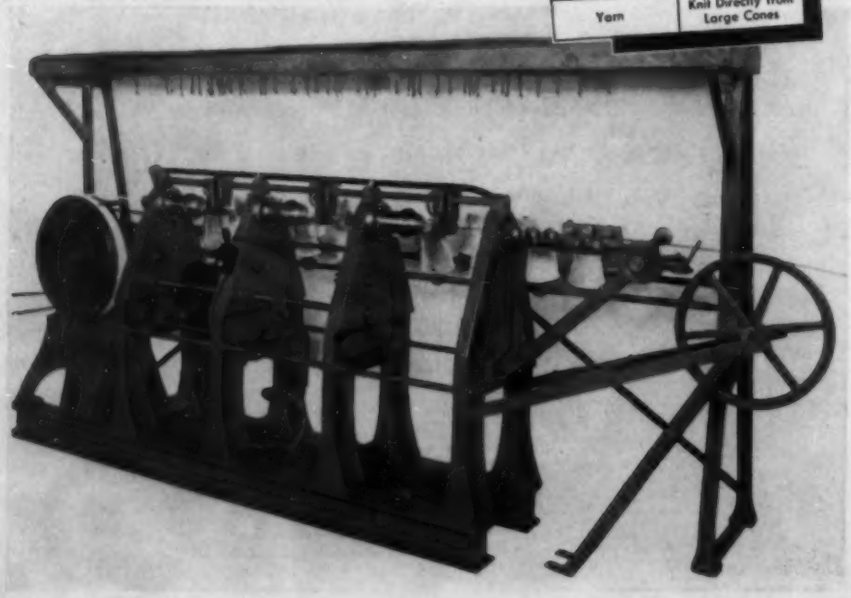
Wire fed over straightening rolls through three knitting heads in series—each head knits one covering. The covered wire then passes on to a 20" or 36" capstan take-off. Separate haul-off reel stand—maximum 40" O. D., 40" traverse, 1000-lb. capacity—simplifies removal of finished product—saves floor space.

Automatic electric stop-motion for each yarn—improved knitting head and needle design ease removal and replacement—knitting direct from large cones eliminates small package winding—and quiet operation reduces operator fatigue.

Compact design, high rate of production and low power consumption make FIDELITY Sinfra Triple-Head Wire Covering Machines time- and cost-savers for you. . . . *Write for Bulletin.*

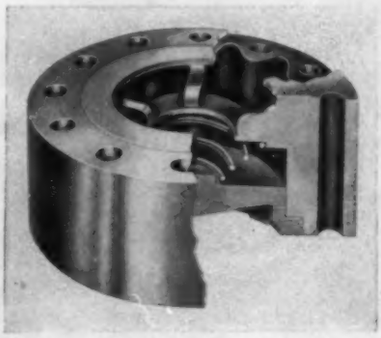
FIDELITY MACHINE COMPANY
3908-18 FRANKFORD AVE., PHILADELPHIA, PA.

SPECIFICATIONS FIDELITY Sinfra Triple-Head Wire Covering Machine	
No. Covers Knitted	3
Rate of Production	1200'–1500' per hour
Size of Wire Covered	Up to #6 Gauge Bare Copper Wire
Power	1 H.P.
Floor Space (Knitting Unit)	12' x 4'
Haul-off Reel Capacity	Max. 1000 lb. Max. 40" O.D.—40" Traverse
Yarn	Knit Directly from Large Cones



Check Valves

Williams Gauge Co., 2064 Pennsylvania avenue, Pittsburgh, announces an improved line of flanged silent check valves for use in waterworks, oil refineries, chemical works, air conditioning systems, hydraulic



services, boiler feed, water supply and other nonreturn flowlines.

Valves in the line are of bronze, cast iron, steel, stainless and monel metal for pressure varying from 150 to 2500 pounds. Their sizes range from 1 to 20 inches inclusive. Only two parts in these valves are subject to wear—the valve disk and seat. Both are easily removable and renewable, and the valve can be reseated without special tools.

What an English Co. Did

(*Continued from Page 88*)

regulations, air raid shelters have had to be built, and in addition, protective walls have been placed around special machinery.

Such is the story of conversion in one firm, but it is typical of many English concerns. The job has been a big one, but it has been tackled in the true British spirit with but one end in view—namely, the proper equipment of the fighting services for the final and complete defeat of the enemy.

Such a large-scale operation as the conversion of industry to war production over the whole country could not have been accomplished without governmental assistance and control. Departments and agencies were set up to centralize and co-ordinate supplying of raw materials and machinery in accordance with production requirements, establishing priorities to meet at any given time the demand of the various departments concerned with war supplies, labor regulations, and the like.

Three Supply Departments

The three main supply departments, charged with furnishing war material are: The Admiralty, the Ministry of Aircraft Production and the Ministry of Supply, the latter being in charge of supplies to the army proper. A Production Executive Committee, under the chairmanship of the Ministry of Labour and National Service, until recently served as a co-ordinating agency. Now the new minister of production, Oliver Lyttleton, is responsible for co-ordination of production. Then there are various controls in charge of the allocation of materials and the establishment of quotas for the various fields of industry. One of the most important of these is the Iron and Steel Control.

The government itself has legislative powers which enable it to issue orders and regulations to meet such contingencies as may arise as a result of the fortunes of war. Such orders and regulations that have been issued fill several volumes. With regard to the engineering industries, these orders and regulations come under three main headings: Control of imports and exports, control of labor, control of undertakings. Most of the emergency legislation enabling the government to take action was passed by Parliament in 1939, at the commencement of the war.

Exports and Imports: Regulations and orders relative to exports and imports have been, and are being, made by the Board of Trade and by the Treasury under powers conferred upon them either by pre-existing customs acts or by the Import, Export and Customs Powers (Defense) Act, 1939, which came into operation on Sept. 1 of that year, and the Import Duties (Emergency Provisions) Act, 1939, which came into operation on Sept. 7.

By prohibiting the exportation of certain goods, the government has achieved the object of reducing the production of certain non-essential goods by cutting off their foreign markets. This has enabled more factory space and more workers to be employed for the production of war material and goods essential to the defense of the country. The prohibition or strict limitation of exports of essential goods insures that practically the whole output of such goods will be available for national purposes. Such is the case for iron and steel.

Similar effects have been obtained by prohibiting or restricting imports of certain materials without which the production of non-essential goods is necessarily curtailed. On the other hand, customs duties have been lifted from certain imported materials which are necessary for the manufacture of essential goods. Thus, exemption of duties has been made as regards pig iron, certain steel products, many built-up products or parts made of iron and steel, machinery

CJB AHLBERG PROVIDES all types of BEARINGS

STANDARD Ahlberg (CJB) Ball Bearings, Ball Bearing Pillow Blocks and Bower "Super-Finished" Roller Bearings suit practically all application requirements.

Whether you use them in new machines or to modernize existing equipment, you will find that these anti-friction units meet today's demands for new high speeds and dependability with economy and efficiency.

Ahlberg (CJB) Ball Bearings have large balls and deep-grooved rings for extra capacity, mirror-finish surfaces for smooth performance. Mounted units have sturdy housings, improved seals, better alignment features. Bower Roller Bearing raceways are "Super-Finished" to 3-millionths-of-an-inch accuracy for permanent close adjustment and quiet operation.

Ahlberg All-Bearing Service is complete and convenient — made available through 24 Factory Branches which carry full stocks and provide engineering aid, plus several hundred leading Supply Houses.

A new and complete catalog will be sent on your request.

AHLBERG BEARING COMPANY

Manufacturers of (CJB) Master Ball Bearings

3015 WEST 47th ST., CHICAGO, ILL.

or parts thereof, railroad materials, and so forth.

The effect of these measures has been to force production out of certain non-essential channels into new directions aiming exclusively toward the war effort. Thus, conversion of industry from peace-time to war-time production has been forcibly assisted.

Control of Labor: Conversion of industry has also been furthered by measures taken to control the employment of labor. The Control of Employment Act passed on Sept. 21, 1939, allows the minister of labor and national service to issue orders to control the movement of labor during the war and to prevent skilled labor from leaving one essential industry for another in such numbers as to impede or cripple the industry they have left. Generally speaking, employers cannot engage, dismiss or re-engage workers without the consent of the minister.

A most important order is the Essential Work (General Provisions) Order, which is modified from time to time to meet changing conditions. It provides that undertakings engaged on essential work may be entered in a schedule kept by the minister of labor. After stating certain provisions that guarantee the welfare and satisfactory conditions of work of the workers, the order says that *the management cannot terminate the employment of a worker except with the permission of a national service officer; a worker cannot leave his employment without such permission.*

Other provisions cover questions of wages, holidays, absenteeism, illegal strikes, dismissals, local appeal boards, the keeping of records, etc. In other words, this order constitutes a kind of charter of the relations between employers and employes in any undertaking listed on the schedule; it endeavors to guarantee stability of working conditions in those undertakings responsible for essential war production. A special order, the Essential Work (Iron and Steel Industry) Order, makes certain amendments to the principal order in regard to the establishment of wages paid to workers in the iron and steel industry.

Another order, the Undertakings (Restriction of Engagement) Order, establishes conditions under which general engineering undertakings among others, not necessarily engaged on essential work, may recruit labor through the machinery of local labor offices operating under the Ministry of Labor and National Service. Workers seeking an engagement must register at such local office.

Dispositions concerning the general control of employment throughout the country and the avoidance of strikes and lockouts also exist under the Defense (General) Regulations made under the Emergency Powers (Defense) Act, which came into force on Aug. 24, 1939. An interesting feature as regards strikes and lockouts is the provision of measures for the establishment of tribunals for the settlement of trade disputes and for the prohibition, subject to the provisions of the order, of strikes and lockouts in connection with any trade dispute.

Control of Undertakings: The Defense (General) Regulations, already mentioned, contain a regulation on "Controlled Undertakings", which applies to war production undertakings. This provides for certain conditions that the undertakers must follow in regard to employment of certain categories of workers and to the fixing of prices for certain articles produced or services rendered; there is also some provisions made for the inspection of factory premises.

Another regulation applies to "General Control of Industry" and enables the competent authority to regulate or prohibit the production, treatment, storage, transport, distribution, disposal, acquisition, use or consumption of articles of any de-

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scription, and to control their prices. It provides for regulating the carrying on of any undertaking engaged on essential work. It contains dispositions concerning the keeping of books and records, the production of books for examination, and also the inspection of premises.

The Priority of Work Order, issued by the minister of supply under the Defense Regulations, establishes machinery for issuing certificates of priority in connection with essential work. Three classes of priority are provided. Manufacturers take all necessary steps to give priority to the execution of any order for which a certificate has been issued.

The Factory Undertakings (Records and Information) Order and the Industry (Records and Information) Order, both issued by the minister of supply under Defense Regulations, make it incumbent on every person carrying on an undertaking to keep certain records and make them available for inspection by the competent authority.

Tool Prices Controlled

The Location of Industry (Restriction) Order, made by the Board of Trade under Defense Regulations, provides that no person shall, except under the authority of a license granted by the Board of Trade, carry on at any premises situated in Great Britain having a floor area of 3000 square feet or more: (A) Any trade or business which would cause those premises to be either a factory or a warehouse, where such premises were previously used otherwise; (B) any trade or business not being carried on at those premises on that date.

A number of detailed orders and regulations have been issued by the minister of supply from time to time dealing with the production, distribution, disposal or acquisition of machine tools; the prices of machine tools are controlled and disposition are also taken in regard to used or second-hand machine tools.

Special measures are in force in connection with machines imported under the Lease-Lend arrangement. One order makes it incumbent upon owners of machine tools or those in control of machine tools, to make a return of those machines that have not been worked for more than 60 hours in the aggregate in a period of 60 consecutive days; such machines cannot be disposed of without special license. Special returns of cutting tools also have to be made to a competent authority.

Detailed orders and regulations are concerned especially with the iron and steel industry. Issued by the Ministry of Supply Iron and Steel Control, they cover the supply of iron and steel products to users, allocations, prices, the supply and distribution of scrap, and so forth. Similar regulations have been made in regard to nonferrous metals. Many orders cover the preservation, distribution and use of scrap materials of all kinds and the prevention of wastage.

A scheme is being followed which provided for the concentration of industry. The Board of Trade, in conjunction with the Ministry of Labor, can take steps to close down factories that are not fully occupied or that make non-essential goods. These factories are taken over by so-called "nucleus undertakings", which become responsible for the manufacture of any quota allocated to the absorbed undertaking, special depositions being taken in order that the absorbed undertaking shall be reasonably compensated, that its patents and trade marks shall be protected, and that these undertakings shall be in a position to resume activities at the cessation of hostilities. These measures enable essential work to be performed with greater efficiency and also have the effect of releasing labor for more important work and providing storage space in the closed factories.

The above summary only covers a part of the mass of regulations and orders made and constantly be-

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FLOSOL wets oily surfaces, is an exceptional soldering flux for steel, brass, copper, tin, terne plate and zinc.

These three are typical of the many ACP Products and Processes, well known in peacetime, that are serving in the war effort.

•

Others include: RODINE, the pickling inhibitor that saves steel and acid, prevents pitting and embrittlement; CUPRODINE that provides a dense, bright copper coating on steel by simple immersion; LITHOFORM for coating galvanized iron before painting to prevent peeling and scaling.

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ing made to meet changing conditions with the object of keeping industry under control and directing production more and more completely toward the manufacture of essential war material. The regulations referred to here are those that most directly affect industry in the process of conversion to war production.

High Quality Steel

(*Continued from Page 92*)

mixture employes 1 pound of aluminum bronze powder, 4 pounds of powdered graphite and 4 fluid ounces of sodium silicate mixed with 1 gallon of water. The cost of aluminum mold wash is roughly one to five cents per ton, depending on the amount of aluminum used and on the cost of the compounding constituent.

Some open-hearth shops use a tar dip which necessitates having the molds design with a small radius at the corners, generally 1 inch, so that the ingots will not develop corner cracks. Both the molds and tar solution must be at the correct temperatures. European practice involves asphalt mixtures.*

Many plants prefer spraying their molds with graphite containing a binder. When this type of mold wash first was used, the graphite settle out of solution, and the molds merely were sprayed with dirty water. Molasses was added but with little effect. When the graphitic wash with a binder was first developed it was assumed that the high degree of purity was not necessary. The purity was lowered by the addition of a siliceous clay binder. A simple test can be made by placing an amount of pure graphite in a beaker of water and similar quantity of graphite containing a binder in another and permit them to settle. In the first case the graphite settles out in about half an hour while that containing the binder will still be in solution after 24 hours. Therefore, the latter when sprayed on the mold wall yields a coating. Too hard a coating promotes caking and will decrease mold life through burning. This solution in a more concentrated condition and/or with greater degree of hardness is ideal for coating mold stools because it increases stool life and eliminates stool stickers. This type of mold wash and careful pouring are helpful in reducing or eliminating splash. Graphite with a binder also is advantageous for coating runner tile for bottom teeming. This wash decreases the number of refractory particles which find their way into the ingot to promote nonmetallic inclusions in the steel.

Plates Prevent Splash

If these special mold washes are supplemented by using plates on the stools, scabs will be practically eliminated. The plates must be of light gage to prevent a reaction with the molten metal. When used with new stools they increase stool life by taking the impact of the steel stream on the initial opening of the nozzle, thus decreasing the "cutting' out. Later when the stools are cut out the plates prevent extensive splash inasmuch as the stream hits the radius of the pocket and accentuates the splash. The knob is not eliminated because the molten steel soon burns through the plate but the plate prevents the initial splash and thus decreases scabs.

Pouring molten steel into ingots is a vital process in the manufacture of low-cost high-quality steel. The pouring temperature should be high enough so that the steel will pour clean, and the skull will not exceed 1000 pounds. Fig. 8 shows the bottom-cast ingots which yield a finished plate weighing 35,000 pounds. Fig. 6 shows the pouring of large slab ingots, 24 x 54 x 72 inches, of low-carbon rimming steel.

With proper deoxidation in the ladle, the analysis will show little

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variation, segregation will be normal, and the yield will be high. No aluminum should be added to the first ingot until the proper amount is determined.

The best practice with lower-carbon rimming grades is to shape up the heats hot and finish pour practically free from skull. Nozzle size naturally affects the pouring temperature and speed of fill. In a test involving 96 heats, 79 heats had no ladle skull, six had a 2000-pound skull, and four had a 3000-pound skull. These figures are offered as relative for the two sizes of nozzles.

Comparison of Pouring Time
(Minutes-seconds)

Ingot No.	Type Nozzle—Round[1]	Type Nozzle—Oval[2]
2	2-10	1-25
4	1-40	1-15
5	1-25	1-15
6	1-25	1-10
16	1-0	1-0
17	1-0	1-0
Total time	41-0	31-0

[1] 1¾ inches diameter.
[2] 1¾ to 2 x 2½ to 3 inches.

Pouring temperatures chosen at random from 160-ton heats follow:

Spout	Temperature—First ingot	Temperature—Last ingot	Temperature—Decrease	Lbs. of skull
3040	2900	2840	140	....
3020	2900	2830	190	....
3000	2900	2830	160	1000
2980	2860	2800	180	4000
2950	2850	2770	180	8000

At one plant pouring 160-ton heats it was found that the temperature differential from a heat free of skull to one having a skull of 15,000 pounds was approximately 75 degrees.

Pouring temperatures and defective steel have a definite relationship. Low-carbon rimming steel should be poured at a temperature range of 2825 to 2850 degrees Fahr. High-carbon killed steel such as S.A.E. 1020, the temperature range should be poured at a slightly lower temperature to yield the lowest percentage of rejections.

Heats that are bottom teemed are somewhat hotter than those that are top poured. However, the temperature of the metal is lower and the speed of fill slower for the same size molds. This feature is controlled by the number of given size molds to the group. Fig. 7 shows a drag of 24 x 54 x 72-inch ingots being stripped of their molds.

The holding time, that is, the lapse of time from the completion of the pour to the beginning of the stripping operation, has an effect on the steel quality, the most importance of which is the occurence of minute laminations. The best results are obtained on rimmed steel by holding it approximately one hour from finish pour to commencing the stripping operation and allowing a two-hour holding period for killed steels and a longer period for the special killed steels.

The usual pouring time for large heats is 40 to 45 minutes which permits ample time for ingots to "set" but not to thoroughly solidify. With increased holding time the life of the molds is decreased and while there is an increase in mold cost this is more than compensated for by improved quality and higher yield.

Casting molten metal direct from the steel ladle into rolls has held the keen interest of experimenters for some years. Trials were made on a machine now employed for the production of nonferrous metals and stainless steels of the nickel type. Strip steel produced by direct rolling did not prove successful although rimmed steel of 0.08 per cent carbon and another of 0.25 per cent carbon silicon-killed steel respectively were cast direct into a mill and resulted in strips 8 inches wide and 80 feet in length. The resultant strip was useless because of numerous minute tears extending

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through the cross section but on annealing excellent grain characteristics were evident.

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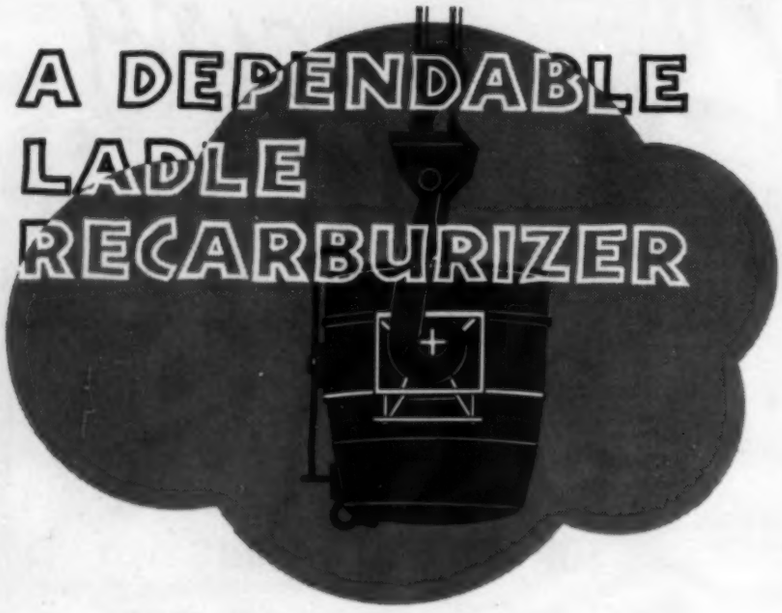

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Henry W. Oliver, Pioneer Iron, Steel Man

Iron Pioneer, Henry W. Oliver, by Henry Oliver Evans; cloth, 370 pages, 5¾ x 8½ inches; published by E. P. Dutton & Co. Inc., New York, for $3.50.

This is a biography of a great industrialist, railroad man and colorful American character, who contributed greatly to the development of the steel industry of the United States.

Born in 1840 at Pittsburgh, Henry W. Oliver in 1863 was head of an important Pittsburgh manufacturing company. He helped develop improved processes for steelmaking, aided in the present design of the blast furnace and was a factor in financing several of Pittsburgh's largest steel industries.

His greatest contribution to the industry, viewed from the present, was in iron ore and his monument today is the Oliver Mining Co., largest iron ore producer in the world, shipper of about half the ore carried on the Great Lakes and holder of 60 per cent or more of reserves in the Lake Superior district. It is the underlying strength of the United States Steel Corp.

During his active career he was in business contact with Andrew Carnegie, John D. Rockefeller, J. P. Morgan, James J. Hill and John W. Gates, all important in preparing the way for the present strong steel industry and mass production era.

The volume is well written, carefully documented and has a satisfactory index. Several appendices contain illuminating material bearing on various phases of the subject's life.

Alloy Introduces Silver In Stainless Steel

An alloy containing 4 per cent silver has gained some commercial use as a master alloy to introduce silver into stainless steel, according to a recent report of the American Silver Producers' Research Project, New York.

Use of the alloy results in a uniform distribution of the silver where such distribution is usually unsuccessful if the silver is added directly rather than in the form of an alloy, it is said.

Purpose of such additions is primarily to decrease pit corrosion, but they are said to provide also a better surface polish (and to do so more easily).

Proportion of silver used is about 1 per cent when nickel is high, or up to 2 per cent when manganese is high. Less work hardening of stainless steel is said to result when silver is employed in this manner.

Publishes Conservation Booklet on Office Items

To push the "war on waste program", Allis-Chalmers Mfg. Co., Milwaukee, is distributing a new conservation booklet on office supplies.

Entitled "It's the Little Things that Count", it points out the importance today of conserving even the most minor office supplies. Further, it goes into detail on the best methods for prolonging the life of items commonly used. Copies are available upon request.

Text on Industrial Furnaces Is Revised

Industrial Furnaces, Vol. II, second edition; by W. Trinks; cloth, 351 pages, 6 x 9 inches; published by John Wiley & Sons Inc., New York, for $5.

In general plan and scope of the second edition are similar to the first. Chapters VI and VII are now consolidated and those parts of chapter VI which were practically a repetition of certain parts of chapter I have been omitted.

Although fundamental conditions have not changed since the first edition was written, theory has been deepened and improved applications have appeared to warrant revision.

Volume II is a continuation of the first, but is complete in itself. While the first volume contains a great deal of theory and appeals mainly to the designer of furnaces, the second is devoted primarily to practice and is an aid to co-ordinators of existing designs. Much equipment is described but names of manufacturers are omitted. Fundamental types have been selected for description as far as possible.

Because of the wide field covered, the author supplemented his own experience by that of others, as presented in publications and communications in which individuals and firms recorded their experiences.

Handling Castings

(*Concluded from Page* 95)

operations also was a factor in bringing about better handling of small castings through the cooling, chipping, grinding, painting and drying operations.

In the cooling room, a low lift truck was replaced with a fork type truck, to permit castings to be stacked in special 2½ x 5 feet corrugated steel boxes, thereby leaving more room for cooling castings. After the castings are cooled, this truck also transports them in the same boxes to the loading platforms beside the tumbling barrels mounted on stands 6½ feet above the floor.

From the tumbling barrels the castings are discharged into chutes which carry them to the grinders and chippers who place them on a conveyor which carries them to the inspectors. After the castings are checked, they are placed on another conveyor which takes them through a paint dip and through a dryer oven.

With the old system, castings in boxes were transported by over head crane through all the foregoing operations. The new procedure saves time and space through constant flow by conveyor and the elimination of unnecessary handling.

After the castings are dried, they are removed from the conveyor, placed in 2½ x 5 feet corrugated steel boxes, transported by fork truck to the scales and then loaded on a trailer for shipment. Use of the truck on these operations has facilitated closer supervision, greater flexibility and more economy than was possible with former method. The tractor trailer system of transportation is used in the yard for handling a wide variety of miscellaneous material constantly in transit between departments.

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Practice Change on Wire Screens Approved

Revision of simplified practice recommendation R147-33, "Wire Diameters for Mineral Aggregate Production Screens", recently approved by the industry now lists the wire sizes recommended for the construction of mineral aggregate production screens in sizes of clear square opening ranging from ⅛ to 4 inches, according to the Division of Simplified Practice, National Bureau of Standards, Washington.

The revised schedule, it is reported, adds wire diameters for openings in the range from 3 to 4 inches, but adds only one new diameter, one inch, to those already listed.

The revision will be identified as recommendation R147-42, and will be effective from June 30 of this year. Until printed copies are available, mimeographed copies may be obtained free from the Division of Simplified Practice.

New Finish Protects Steel Shell Cases

A new straight phenol formaldehyde finish, to coat the interior lining of Army steel shell cases against conditions of use or corrosion caused by the action of powder, rust or other agents is reported by the Zapon Division, Atlas Powder Co., Wilmington, Del. Known as S-198-C, it is said to more than fulfill rigid military requirements.

Principles of Analysis For Trade Training

Trade and Job Analysis, by Verne C. Fryklund; cloth, 167 pages, 5½ x 7¾ inches; published by Bruce Publishing Co., Milwaukee, for $1.75.

This is a compact presentation of the underlying principles of trade and job analysis, which can be applied to any occupation involved enough to require instruction. The author is a teacher-trainer, in which capacity he has assisted both tradesmen and workers in many occupations in analyzing their jobs. He presents the process here in understandable and practical manner.

By comparisons drawn from familiar trades and occupations, by ample definition of terms and by illustrative charts he clarifies the various phases of trade and job analysis.

Trade elements are identified, important related information is presented, method of making the analysis of custom and service trades is explained and methods shown for applying the results to organizing a course for job training.

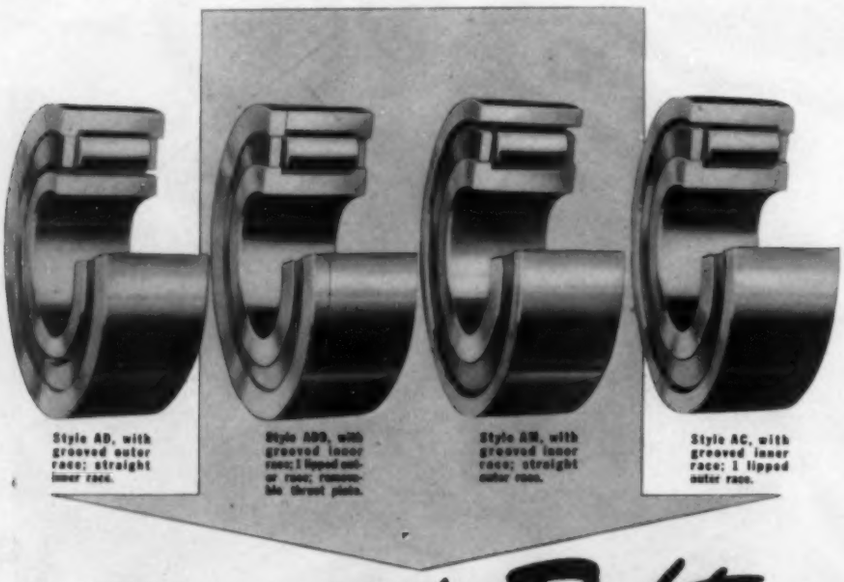
Practice Reduces Dental Bur Sizes 76 Per Cent

Division of Simplified Practice, National Bureau of Standards, Washington, announces a simplified practice recommendation for dental excavating burs which will reduce the number of bur sizes manufactured from about 75 to 18—an elimination of 76 per cent.

Developed for and in co-operation with the Health Supplies Branch, War Production Board, as part of a broad program of simplification of dental equipment and supplies, the recommendation is effective from June 25, 1942.

Both the Army and Navy Dental Corp., the Health Supplies Branch of WPB, manufacturers of dental burs, the American Dental Trade Association, the committee on supplies of the association and the Division of Simplified Practice collaborated in the development of the recommendation. It also has been approved by WPB as Schedule 1 to General Limitation Order L-139.

The recommendation is designated as R195-42, and pending printing, free mimeographed copies may be obtained from the Division of Simplified Practice.


Style AD, with grooved outer race; straight inner race.
Style ADO, with grooved inner race; 1 lipped outer race; removable thrust plate.
Style AH, with grooved inner race; straight outer race.
Style AC, with grooved inner race; 1 lipped outer race.

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Issues New Hand Book On Care of Motors

Those prewar books on motor care are now out of date with motors operating 168 hours per week instead of the usual 40.

To correct this situation, Allis-Chalmers Mfg. Co., Milwaukee, published a new handbook entitled *A Guide to Wartime Care of Electric Motors.* Taking a new slant on the subject of motor care under war conditions, the publication is said to be of great value to plant engineers and maintenance men, and to be of particular value for training new men. The book is available upon request.

Offers Designers Socket Screw Dimension Finder

A socket screw dimension finder that helps speed up work is being offered free by Parker-Kalon Corp., 200 Varick street, New York. It gives designers, engineers and production men all important dimensions of the standard sizes of socket head cap screws, stripper bolts and set screws at a glance.

The finder is 10 inches in diameter and is printed in two colors on heavy card stock. This offer is limited to designers, engineers, drafting and production men in key positions who request the finder on their company letterhead, mentioning their title and make of socket screw they use.

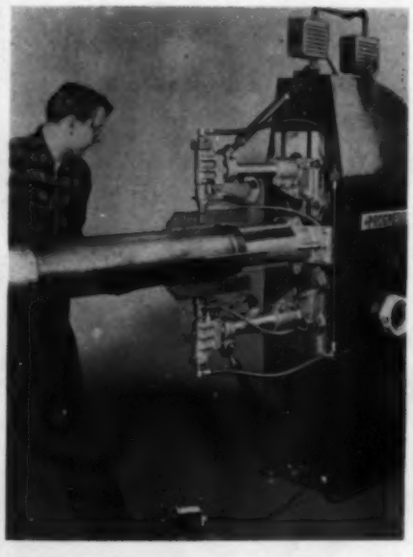
Pictures Part Standards Play in War Effort

The part that standards are playing in the war effort is pictured in a recent special issue of its house organ, *Industrial Standardization,* just released by the American Standards Association, 29 West Thirty-ninth street, New York.

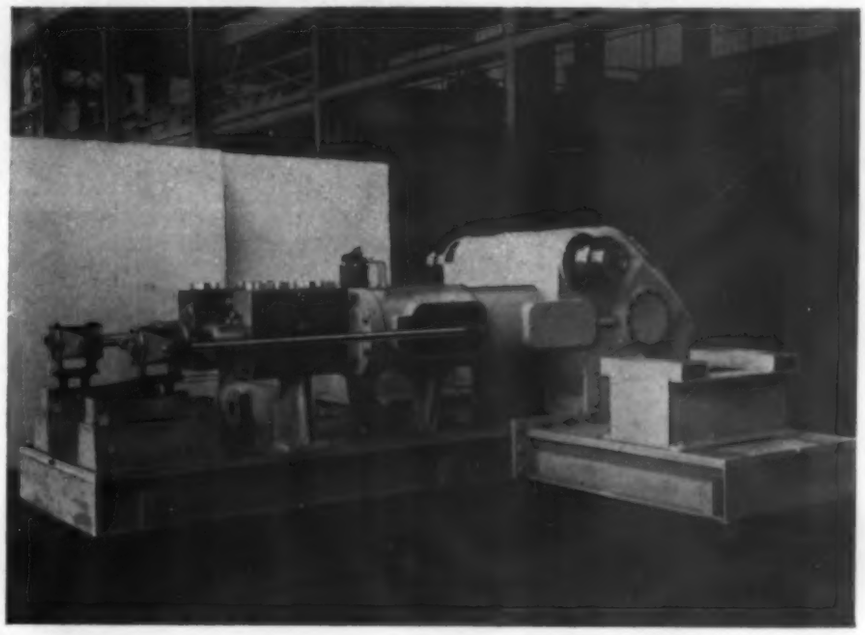
In the publication Leon Henderson tells how standards are being used in the government's price control program; C. L. Warwick describes the use of emergency specifications to save scarce materials; Howard Coonley tells of the War Production Board's work on simplified lines and standards.

In addition, another group of articles outlines government use of standards in Army procurement, in ordnance inspection, in safety work, etc. Also included are some articles on the use of standards in war production written from the point of view of the large and small company, of prime contractor and of subcontractor.

"Stitching" Parachute Flares



ROWS OF SPOT welds now "stitch" on the fins to the housings for the Army's giant parachute flares. This operator shown in the view above merely pushes the housing along on this Progressive pedestal welder equipped with an upper and lower gun. Both guns weld the housing simultaneously attaching the fins with 36 welds. Center electrode of the welder is fixed and serves as a mandrel for guiding housing



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If you would like to simplify your materials handling problems, ask for a copy of "144 Answers to Your Hoisting Problems". It will be mailed to you postpaid.

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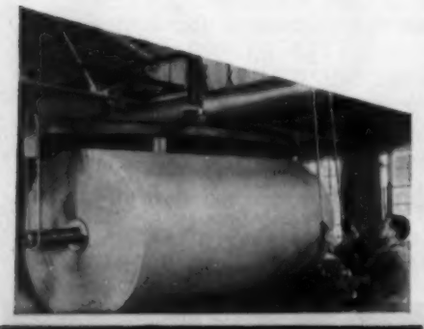


READING
Chain Hoists, Electric Hoists,
Cranes and Monorails

Shortcuts in

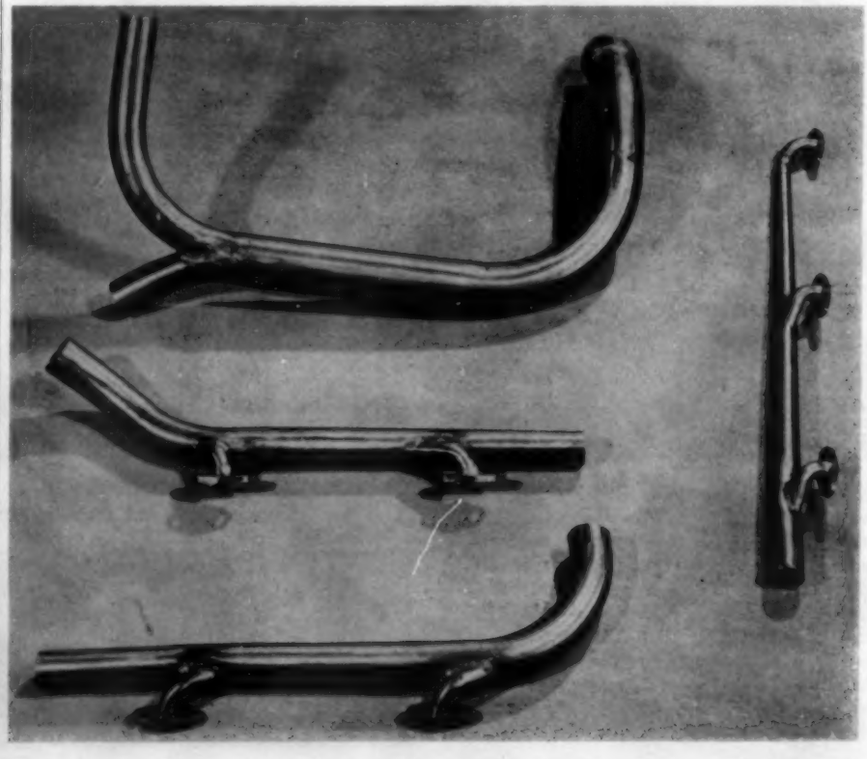
FABRICATING STAINLESS MANIFOLDS

PRELIMINARY designs of manifolds for the coolant circulating system of a recently developed liquid-cooled aircraft engine indicated that 18-8 stainless tubing made by forming and welding coiled strip of the desired wall thickness would be suitable. The primary reasons for this selection were the high strength and corrosion resistance of this material.

However, a number of problems had to be solved before the application could be regarded as completely satisfactory. Reference to the accompanying illustration shows that the tubing is called upon to undergo a considerable variety of operations during fabrication. Forming operations include bending, tapering, expanding and flaring. Also, welding is employed to join the tube bends and to join bolting flanges to outlet and inlet. Therefore it was not only necessary to examine the welding and mechanical working properties of the material but also the metallurgical effects of these operations.

Consultation with a manufacturer of stainless welded tubing resulted in several minor changes being made in the first design and the adoption of tubing specifications favorable to economical and safe construction. By thus taking advantage of the experience of the supplier, it was possible to avoid those disappointments and delays which could easily have resulted from inadvertently neglecting simple rules, or from the arbitrary choice of dimensions which may have been more convenient than vital. As it was, the intricate parts illustrated were made to meet exceptionally close tolerance limits by consulting the tubing supplier and fabricator and ascertaining in advance what the maximum and minimum limits should be on the various items.

For example, in several parts it is necessary to join machined bolting flanges to pieces of formed tube. If these flanges were finish machined to final size before welding, difficulty would be encountered in making the weld so the whole part



A group of typical component parts for an aircraft engine coolant system made from welded tubing of 18-8 stainless with a wall thickness of only 0.032-inch. Of course mounting flanges are much heavier material. Photo from Formed Steel Tube Institute, New York

would fit in place without further machining. But simply by welding the rough machined flanges and then finish machining them after welding, an accurate fitting assembly is produced.

In consulting the engineers of Alloy Mfg. Co., Pittsburgh, as a preliminary to preparing final specifications for the tube fabrication, several items were found which involved one bend in one plane interlocked with another bend in a second plane without any tangent interval between them. This usually requires fabrication of half-tube sections on a drop hammer, and assembly of sections by welding. However, by forming the desired bends in different pieces of tube and then welding the bent pieces together, the desired shapes were produced with reasonable speed and cost. This type of welding operation can usually be avoided by further redesign, when production volume warrants it, it has been found.

To make these parts from 18-8 material with a wall thickness of only 0.032-inch and with some of the small outlets bent on a radius of only ⅝-inch might easily have been classed as impractical without careful engineering at every step. Yet it is apparent, the Formed Steel Tube Institute points out, that the limitations on the fabrication of welded stainless tubing are no more severe than on other types of tubing and that scrap losses are greatly reduced by taking advantage of every fabrication shortcut such as those mentioned.

Wood Replaces Steel In Units—Temporarily

Sanymetal Products Co. Inc., Cleveland, reports the substitution of wood for its four types of steel toilet compartments to conserve metal for war.

These compartments, according to the company, are similar in design to the steel units, 7-ply douglas fir plywood being used for partition panels and doors.

Tool Company Publishes Book on Hob Sharpening

A text book of 27 pages, entitled "Right and Wrong of Hob Sharpening", has been published by Illinois Tool Works, 2501 North Keeler avenue, Chicago. This is one of a series of technical data texts of which one on "Elements of Broach Design" also will be available very soon.

It is brought out, at the beginning of the book, that cutting of gears, splines, sprockets and other forms by the generating method can well be called a "mathematical cutting process". Therefore various details of the hob, its setting and the motions of the hobbing machine must be maintained in strict mathematical relationship. That means of course that when the hob is resharpened, this must be done in such a way as to maintain this exact relationship. For instance, faces of the flutes must be held in definite relation to other elements.

With the help of 22 line drawings —many of them in two colors to show two conditions—various errors, such as runout, are shown and their correction explained. Those showing grinding setups are in perspective for increased visual clarity and to show the exact purpose of various shapes of abrasive wheels. The diagrams are backed up by full and clearly written text which should enable anyone of reasonable mechanical ability to diagnose all ordinary hob troubles and to correct them through proper grinding and setting.

Copies of this and other books in the series are or will be available free of charge to those who write to Illinois Tool Co. giving satisfactory proof that they are actively dealing in industry with the problems dealt with in the books.

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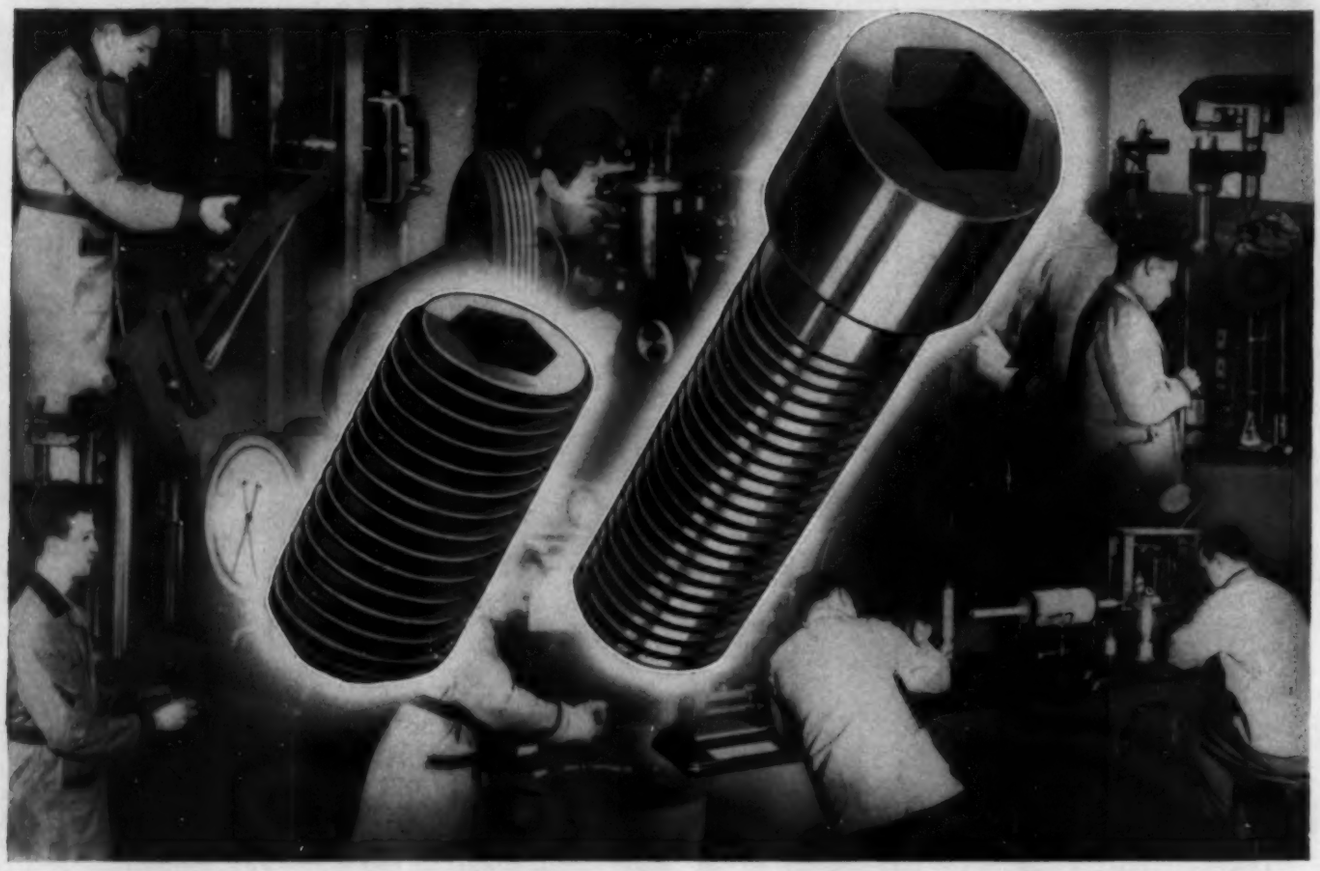

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Give the Green Light to War Assemblies

Helpful Literature

1. Refractory Products

Mexico Refractories Co.—8-page catalog, "Choosing The Correct Product To Meet Specific Service Conditions," includes complete chart of utility of refractories and resistance to destruction. Included are specifications and discussions of composition, viscosity, reduction and oxidation, abrasion, melting, spalling, rigidity, disintegration and confinement of heat.

2. Crankshaft Lathes

Wickes Brothers Co.—12-page illustrated bulletin No. U-801 describes double end drive arrangement of lathes for turning crank pins and main line bearings, and single end drive for turning main bearings in wide variety of models and units. Specifications for both double end drive and single end drive are included in bulletin.

3. Electric Hoists

Shaw-Box Crane & Hoist division, Manning, Maxwell & Moore, Inc.—28-page illustrated bulletin No. 350 describes "Load-Lifter" electric hoists which are available in wide variety of types and sizes. Disassembled views show component parts and installation views show representative installations. Specifications are included.

4. Electric Motors

Allis-Chalmers Manufacturing Co.—16-page illustrated bulletin No. B-6210 announces new "Safety Circle" construction for "Lo-Maintenance" electric motors. Wide solid internal rib, integrally cast as part of frame, completely encircles stator core, acts as anchored shock-absorber, and gives motor high resistance to blows, knocks and falling objects.

5. Bearing Oil Seals

Chicago Rawhide Manufacturing Co.—34-page illustrated catalog, "Perfect Oil Retainer," includes bearing applications and general information for sizes and prices. Descriptions of special oil seal construction and wide variety of units are given. Diagram includes information of packing, lubrication, wiping tip, tension spring, ground outer cup and other structural features.

6. Dust Collectors

Pangborn Corp.—6-page illustrated bulletin No. 907 describes unit type dust collectors which permit operating flexibility, reduced piping costs, lowered operating costs, and separate collection and reclamation of different materials. Photographs show typical installations.

7. Armor Piercing Shot

Metal Equipment Co.—4-page folder is complete with diagrams and specifications of continuous air drawing ovens and thermal shock equipment. Tables are given containing dimensions for various sizes and capacities. Included are specifications of oven shell, heating system, ductwork, conveyor, structural work, temperature control, safety controls.

8. Portable Power Plant

Kato Engineering Co.—2-page illustrated bulletin No. 1241 sets forth specifications and features of line of gasoline engine driven power plants in 7500, 10,000 and 15,000-watt capacities. Component parts are fully described in text and tables.

9. Hoists

American Engineering Co.—28-page illustrated catalog No. H-40 gives complete information on how to choose hoist according to purpose. Discussion on what to look for in hoist is included. Descriptions of lifts, suspensions and dimensions, and complete diagrams of construction and installation are given. Controls of hoists such as cord, push button, remote, cab and foundry controls are all included.

10. Pumps

Geo. D. Roper Corp.—12-page illustrated bulletin treats "Rotary" pumps which have only two moving parts—equal size pumping gears operating in a case with just enough clearance so that there is no perceptible wear. Design and construction features are explained in detail with line drawings and disassembled views.

11. Distribution Transformers

Westinghouse Electric & Manufacturing Co.—24-page illustrated bulletin No. 46-100 describes self-protecting "CSP" distribution transformers with "HIPERSIL" core. Features are illustrated, and four pages give details of series of ten tests which are applied to all transformers before shipment to job.

12. Motorized Truck

Yard-Man, Inc.—6-page illustrated bulletin describes "Truck-Man" motorized truck which has capacity of 2000 pounds and which lists for $600. It is powered by gasoline motor which can be operated for approximately four hours continuously at three-fourths load on two quarts of gasoline. Standard hydraulic system, motor and pneumatic tires are used. Full specifications are tabulated.

13. Spot Welding

Pier Equipment Manufacturing Co.—12-page illustrated catalog, "Increased Production," discusses production increases, strength and economy obtainable through spot welding. Complete descriptions of transformers, contactors and essential elements are given. Included are adaptions of automatic weld timing and regular controls. Models and specifications are listed.

14. Milling Machines

The Cincinnati Milling Machine Co.—16-page illustrated catalog, "Specifications," describes highlights of milling machine design such as hydraulic rise and fall of mechanism, one lever control, spindle carrier, dog controlled feeder and speeds. Diagrams of set ups and descriptive charts are included. General specifications for most models are included. Complete list of extra equipment is also added.

15. Colloidal Graphite

Acheson Colloids Corp.—4-page bulletin No. 31C is one of series of technical bulletins pertaining to the application of colloidal graphite to industry. This one deals with role of graphite in electronics and covers such phases as vacuum tube emissions, method of application, internal tube coating, effects gained, electrostatic shielding and photoelectric cells.

16. Lock Nuts

Laminated Shim Co., Inc.—6-page illustrated folder "An-cor-lox" fully describes this self-locking nut with diagrams, photographs, specification matter, materials, designs and finishes. Applications of device are included. Special order specifications are given.

17. Springs

The Lee Spring Co.—12-page illustrated catalog, "What Alloys Have To Do With Springs," gives complete information, including description, manufacturer, application and chemical composition of materials. Charts of summary of physical properties useful for design calculations, tensile strength, comparison of chemical composition are all given. Included are specifications of wire strip and tensile strength.

18. Liquid Salt Baths

E. F. Houghton & Co.—16-page illustrated catalog, "Liquid Baths," describes uses of baths in carburizing, annealing, reheating, tempering and neutral hardening. Complete charts and diagrams are given and include operating ranges of salt baths. Specifications are included.

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19. Specification Finishes

Maas & Waldstein Co.—8-page folder on Government specification finishes. Folder provides makers of armament products with essential information on finishes that have been made to conform with various Government specifications.

20. Surface Grinding

Mattison Machine Works—Four pages give details of work and set-ups for various types of operations performed on "High-Powered" precision surface grinders. Data includes size of machine, materials ground, previous method, present method, savings and remarks for handling cast iron slides, cast iron housing, high pressure pump case and cast iron frame.

21. Automatic Machines

The Cleveland Automatic Machine Co.—8-page illustrated folder "Single Spindle Model B" gives complete description of this model including information on cross slide turning attachment, independent cutoff equipment, rotary tilting magazine and hopper magazine. Complete chart of specifications for model B are included.

22. Grinding Procedure

Norton Co.—88-page illustrated bulletin is entitled, "The ABC of O.D. Grinding." It explains operation and various parts of cylindrical and centerless grinders, and lists principal points to keep in mind in setting up grinding jobs. Another subject covered in detail and amplified with table is selection of proper grinding wheel.

23. Furnaces

Surface Combustion Co.—4-page illustrated bulletin No. SC-101 describes forced convection furnaces in standard and special types, direct and indirect gas or oil fired, for high and low temperature heating of coils, strips, nuts, bolts, crankshafts, laminations and miscellaneous parts.

24. Standard Tools

Carboloy Co., Inc.—8-page illustrated catalog No. GT140 covers complete line of standard tools with new prices effective this year. Bulletin covers all styles and types of tools offered. Included are drawings and tables showing major specifications and tool angles. Also given are considerable number of typical adaptations by which these standard tools can be rapidly converted to special machining requirements.

25. Asbestos Walls

Johns-Manville — 4-page illustrated folder form TR-29A describes how movable asbestos walls make possible construction of completely finished new offices overnight. Construction methods are discussed and details are given.

26. Pneumatic Cylinders

Hannifin Manufacturing Co.—32-page illustrated bulletin No. 57 contains engineering information on complete line of pneumatic cylinders and control valves. Types of mountings, cylinder areas, piston rod sizes, lengths of stroke, and dimensions are given.

27. Stainless Electrodes

The McKay Co.—16-page illustrated catalog, "Certified Stainless Electrodes," discusses electrode coating, polarity, current values and restriking arc. Included is alloy description, chart and table. Welding procedure, modification and types are all featured. Complete line of shielded-arc electrodes, flux coated electrodes and wire for automatic welding is discussed.

28. Honing Machines

Micromatic Hone Corp.—16-page illustrated bulletin AR-60 describes model 100 and 200 "Hydrohoners." Photographs and line drawings show various machine set-ups and types of work honed. Each operation is briefly explained with details of finishing requirements, amounts of stock removed and other data.

29. Metal Surface Treatments

Turco Products, Inc.—Four bulletins are titled, "Surface Treatment of Magnesium Castings;" "Anodizing of Aluminum Alloys in Chromic Acid;" "Turco Procedure for Precleaning Before Anodizing, Chromatizing, Phosphatizing;" and Turco W.O. No. 1 Approved Treatment for Obtaining Adhesion of Paint Coatings on Aluminum Alloys."

30. Hydraulic Presses

A. B. Farquhar Co., Ltd.—8-page illustrated bulletin No. 42-S-HP gives complete information on cartridge case drawing presses, shell piercing press, forming press, bench press, forging and extrusion press, joggling press, bushing and forcing press and forcing presses of varied sizes. Specifications for each press are included.

31. Power Cylinders

Hanna Engineering Works—28-page illustrated bulletin No. 230 describes complete line of power cylinders for use in jobs requiring pushing, pulling or lifting movement. Capacities, dimensions, length of stroke, mounting brackets, clevises, control valves and other information are covered in detail.

32. Cranes

Harnischfeger Corp.—28-page illustrated bulletin No. H-13 includes applications, types and complete diagrams and charts. Motors used, current necessary, construction and design features are well described. Crane inquiry form is attached for those wishing more information or special specifications.

33. Exhauster and Dust Separator

American Air Filter Co.—16-page illustrated catalog No. 274A describes performance, air delivery, disposal, water requirement, installation and flexibility of machines. Diagrams of parts and operation are included with diagrams for arrangements. Construction details are included. Tables of operation and pipe resistance charts are given.

34. Bus-Drop Cable

General Electric Co.—2-page illustrated folder GEA-3801 gives description of bus-drop cable and how it is installed. Diagram of installation is given. Included is information about cable that lists conductors, insulation, ground wires, assembly and protective finish. Chart of specifications is given.

35. Group Washfountains

Standard Washroom Equipment division, Sugar Beet Products Co.—Illustrated bulletin No. 29-H explains advantages of group washfountains for promoting good will, cleanliness, and eliminating lost time and skin irritations and diseases. Engineering drawings and photographs point out advantages of various types of these units.

36. Copper-Silicon Fastenings

American Brass Co.—16-page illustrated bulletin E-6 covers "Everdur" metal for bolts, screws and accessories. Tabulated are general physical constants, physical properties, characteristics of various fastenings and applications of bolts, screws and special accessories such as U bolts, eye bolts, turnbuckles, thimbles and wire rope sockets.

37. Gear Lead Checker

Michigan Tool Co.—4-page illustrated bulletin No. 1205 gives information covering "Sine-Line" method operation, dimensions and other data for machine which is capable of measuring gear leads from zero to infinity. Several views of operating mechanism and table of specifications are included, in addition to illustrations of new machine.

38. Zinc

New Jersey Zinc Co.—4-page illustrated bulletin is entitled "Zinc in War." It briefly explains role that zinc is playing in war effort and pictures diversified applications of metal alloys and compounds in optical glass, metal spraying, paint manufacture and rubber compounding.

39. Hydraulic Jacks

Watson-Stillman Co.—4-page bulletin 710-A deals with independent-pump jacks, vertical outside-pump jacks and horizontal outside-pump jacks. Complete specifications are given for all three types, including capacity, maximum rise, ram diameter, and weight.

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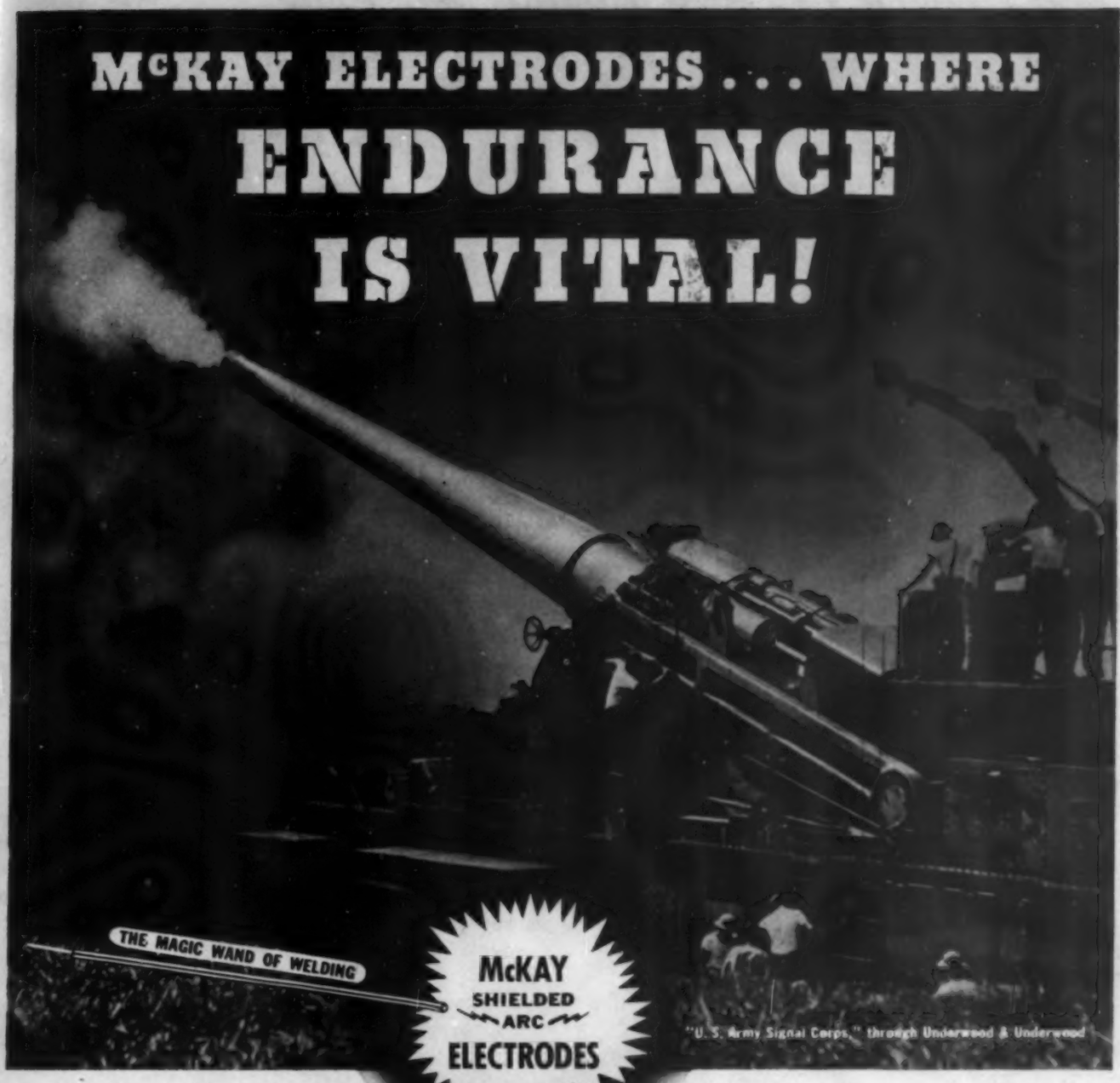

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MARKET SUMMARY

DEMAND

Allocations and directives cover most orders on mill books.

PRODUCTION

Unchanged at 97½ per cent, repairs preventing increase.

PRICES

No changes in established ceiling quotations.

Directives Cover Nearly All Steel Orders

Little tonnage remains for rated deliveries . . . New designations not yet applied to orders on mill books . . . June plate production again over million tons . . . Ingot production sets record

EXTENT to which allocations and directives have superseded priority ratings is indicated by the statement of an eastern steelmaker that more than 83 per cent of its orders are covered by direct order and less than 17 per cent is available for A-1-a or lower ratings. In the Chicago district mills estimate that approximately 90 per cent of orders are on directives.

Reclassification of orders under the new designations, AAA, AA-1, AA-2, etc., has not been undertaken to any extent, except that orders formerly rated at AA have automatically become AA-2. The latter rating now is the measure for deliveries on most products. For several weeks producers have been unable to promise definite deliveries on major products with A-1-a rating and at present this priority has practically no standing. Assignment of the higher ratings under the new plan is expected to appear soon but as long as the high proportion of allocations persists even these will not have much effect.

Shipment of carbon bars on AA ratings runs six to eight weeks, sheets four to six weeks and structural shapes six to eight weeks, these deliveries being subject to modification as further directives are applied. Current promises on AA tonnage stand better than an even chance of being fulfilled. It appears likely deliveries on A-1-a tonnage would be no better than 10 to 12 weeks on carbon bars and shapes and eight to nine weeks on sheets, subject to considerable doubt as the effect of allocations develops.

* * *

Plate production in June exceeded 1,000,000 tons for the second consecutive month and July output is expected to be larger, in view of the longer month and new records being set by some mills. Some observers set 1,250,000 tons for July as possible, but more conservative estimates do not reach that high. It is expected the goal of 1,400,000 tons monthly may be reached in the fall.

Deliveries of small lots of steel are being made to various parts of the world by clipper airplane. An order for valve spring wire was taken recently by an eastern wire producer, to be sent to India by plane.

Steel ingot production in first six months totaled 42,570,247 net tons, 4 per cent more than the first-half production in the record year, 1941. June output was 7,002,155 tons, compared with 7,386,890 tons in May. In June, 1941, total production was 6,792,751 tons. The first half total is at the rate of more than 85,000,000 tons per year.

Steelmaking last week remained unchanged from the previous week, furnace repairs and limited scrap supply preventing an increase. Pittsburgh advanced 1 point to 95 per cent, Cleveland 3 points to 95 and Cincinnati 1 point to 92. Chicago continued to decline, dropping 1½ points to 101½ per cent, Wheeling was down 6 points to 77½, Detroit 2 points to 89 and New England 3 points to 92. Production was steady at St. Louis, 95½ per cent; Buffalo, 90½; eastern Pennsylvania, 96; Birmingham, 95; Youngstown, 95.

* * *

Lend-lease requirements, about 650,000 tons per month, are increasingly contracting supply of semifinished steel for domestic products and some finishing mills are operating only intermittently as steel is received. This applies to sheets and wire especially.

Substitutions for alloy steels are being applied more closely. One producer received back his July schedule for alloy steels with more than 100 changes in chemical composition, as part of the campaign to save critical alloying elements. Alloy requirements are to be scanned more closely to make as much saving as possible.

Effect of the concerted drive for increased scrap collections, starting July 13 under auspices of the Bureau of Industrial Conservation, is awaited with interest. Current shipments of scrap are just about equal to demand in view of the high rate of steelmaking, little material being stocked for future use.

Composite steel and iron prices hold unchanged at ceiling levels prevailing over the past few months. Finished steel composite is $56.73, semifinished steel at $36, steelmaking pig iron at $23.05 and steelmaking scrap at $19.17.

COMPOSITE MARKET AVERAGES

	July 11	July 4	June 27	One Month Ago June, 1942	Three Months Ago April, 1942	One Year Ago July, 1941	Five Years Ago July, 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$62.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	40.00
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	23.05	22.84
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	18.70

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	July 11, 1942	June 1942	Apr. 1942	July 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.49	2.49	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.22	2.22	2.27
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	July 11, 1942	June 1942	Apr. 1942	July 1941
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.34	25.39	25.39	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	24.06
No. 2X, del. Phila. (differ. av.)	26.215	26.265	26.265	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.54	31.54	31.54	31.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.19
Ferromanganese, del. Pittsburgh	140.65	140.65	125.63	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	17.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	21.50

Coke

Connellsville, furnace, ovens	$6.00	$6.00	$6.00	$6.25
Connellsville, foundry, ovens	7.25	7.25	7.25	7.25
Chicago, by-product fdry., del.	12.25	12.25	12.25	12.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941 and Feb. 4, 1942 The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. All seconds and off-grade products also are covered. Exceptions applying to individual companies are noted in the table.

Semifinished Steel

Gross ton basis except wire rods, skelp.

Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, $31.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at $33 gross ton, f.o.b. mill.)

Alloy Steel Ingots: Pittsburgh base, uncropped, $45.00.

Rerolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $34.00; Detroit, del. $36.25; Duluth (bil.) $36.00.
(Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade rerolling billets under lease-lend during first quarter 1942 at $37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs $41 gross ton at established basing points.)

Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $40.00; Detroit, del. $42.25; Duluth, $42.00.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points.)

Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., $52.00; 12-18 in., $54.00; 18 in. and over, $56.00.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54.00.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $34.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel sheet bars at $39 gross ton, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, lb., $1.90.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., $2.00.
Do., over 9/32—47/64-in., incl., $2.15. Worcester add $0.10 Galveston, $0.27. Pacific Coast $0.50 on water shipment.

Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.27c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.52c, all-rail 2.59c Pac. ports, dock 2.50c; all rail 3.25c.
(Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.)
Joslyn Mfg. Co. may quote 2.35c, Chicago base.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c Detroit, del. 2.82c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	5100 Spr. flats	0.15
2100	0.75	5100 80-1.10 Cr	0.15
2300	1.70	6100 Bars	1.20
2500	2.55	6100 Spr. flats	0.85
3100	0.70	Carb., Van.	0.85
3200	1.35	9200 Spr. flats	0.15
3300	3.80	9200 Spr. rounds, squares	0.40
3400	3.20	T 1300, Mn, mean 1.51-2.00	0.10
4100 .15-25 Mo. 46.00 .20-.30 Mo. 1.50-2.00; Ni	0.55 1.20	Do., carbon under 0.20 max.	0.35

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.47c.

Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c; Detroit 2.72c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.27c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.25c.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.33c, f.o.b. mill.

Iron Bars: Single refined, Pitts. 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.22c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.
(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O. base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.17c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c Phila del. 3.68c; Pacific ports 4.05c.
(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.

Enameling Sheets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage,

base 2.75c; Granite City, base 2.85c; Pacific ports 3.40c.
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c; Granite City, base 3.45c; Pacific ports 4.00c.
Electrical Sheets, No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.20c	3.95c	3.30c
Armature	3.55c	4.30c	3.65c
Electrical	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.22c; Pacific ports 2.75c. (Joslyn Mfg. Co. may quote 2.30c, Chicago base.)
Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.92c; Worcester base 3.00c.
Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Worcester base 3.35c.
Cold-Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, $5.00; Granite City $5.10.
Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed 4.05c.
Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c.
Manufacturing Ternes: Pittsburgh, Chicago, Gary, 100-base box $4.30; Granite City $4.40.
Roofing Ternes: Pittsburgh base per package 112 sheets, 20 x 28 in., coating I.C., 8-lb. $12.00; 15-lb. $14.00; 20-lb. $15.00; 25-lb. $16.00; 30-lb. $17.25; 40-lb. $19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.10c; New York, del., 2.30-2.55c; Phila., del., 2.15c; St. Louis, 2.34c; Boston, del., 2.42-67c; Pacific ports, 2.65c; Gulf Ports, 2.47c.
(Granite City Steel Co. may quote carbon plates 2.35c, f.o.b. mill. Central Iron & Steel Co. may quote plates at 2.20c, f.o.b. basing points.)
Floor Plates: Pittsburgh, Chicago, 3.35c; Gulf ports, 3.72c; Pacific ports, 4.00c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c.
Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes

Structural shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del., 2.28c; Phila., del., 2.22c; Gulf ports, 2.47c; Pacific ports, 2.75c.
(Phoenix Iron Co., Phoenixville, Pa. may quote carbon steel shapes at 2.30c at established basing points.)
Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add $2 for Worcester):

Bright basic, bessemer wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Wire Products to the Trade:	
Standard and cement-coated wire nails, polished and staples, 100-lb. keg	$2.55
Annealed fence wire, 100 lb.	3.05
Galvanized fence wire, 100 lb.	3.40
Woven fence, 12½ gage and lighter, per base column	67
Do., 11 gage and heavier	70
Barbed wire, 80-rod spool, col.	70
Twisted barbless wire, col.	70
Single loop bale ties, col.	59
Fence posts, carloads, col.	69
Cut nails, Pittsburgh, carloads	$3.85

Pipe, Tubes

Welded Pipe: Base price in carloads to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
⅛	56	33	⅛	24	3½
¼ & ⅜	59	40½	¼	30	10
½	63½	51	⅜-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
2	61	49½	1¼	23	3½
2½-3	64	52½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½, 3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	12

Boiler Tubes: Net base prices per 100 feet, f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O. D. Sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Lap Weld— Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	.....

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, $40.00.
Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $40.00.
*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $28-$30.
Supplies: Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.: Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.
High Speed Tool Steels:

Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1		67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
1.5	4	1	8.5	54.00c
	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
*316	40.00	44.00	48.00	40.00	48.00
*317	50.00	54.00	58.00	50.00	58.00
†321	29.00	34.00	41.00	29.25	38.00
‡347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIGHT CHROMIUM STEEL					
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡430F	19.50	22.50	29.50	18.75	24.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
STAINLESS CLAD STEEL (20%)					
304	.....	‡‡18.00	19.00	.....	.....

*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. ‡‡Free machining. §§Includes annealing and pickling.

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.
Extras mean additions or deductions from base prices in effect April 16, 1941.
Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.
Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price.
Emergency basing point is the basing point at or near the place of production or origin of shipment.
Dislocated tonnage: Producers shipping material outside their usual marketing areas because of the war emergency may charge the basing point price nearest place of production plus actual cost of transportation to destination.
Seconds or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.
Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941. Domestic or export extras may be used in case of Lease-Lend tonnage.

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine	
½ x 6 and smaller	65½ off
Do., ⅝ and ¾ x 6-in. and shorter	63½ off
Do., ⅞ to 1 x 6-in. and shorter	61 off
1¼ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off
Stove Bolts	
In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Nuts	
Semifinished hex.	U.S.S. / S.A.E.
⅞-inch and less	62 / 64
⅛-1-inch	59 / 60
1⅛-1⅛-inch	57 / 58
1¼ and larger	56
Hexagon Cap Screws	
Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off
Square Head Set Screws	
Upset, 1-in., smaller	71 off
Headless, ¼-in., larger	60 off
No. 10, smaller	70 off

Piling

Pittsburgh, Chicago, Buffalo 2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
⅞-inch and under	65-5 off
Wrought washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.	$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, furnace	$6.00
Connellsville, foundry	7.00- 7.50
Connellsville prem. fdry.	7.25- 7.60
New River, foundry	8.00- 8.25
Wise county, foundry	7.50
Wise county, furnace	6.50
By-Product Foundry	
Kearny, N. J., ovens	12.15
Chicago, outside delivered	11.50
Chicago, delivered	12.25
Terre Haute, delivered	12.09
Milwaukee, ovens	12.25
New England, delivered	13.75
St. Louis, delivered	12.25
Birmingham, ovens	8.50
Indianapolis, delivered	12.00
Cincinnati, delivered	11.75
Cleveland, delivered	12.30
Buffalo, delivered	12.50
Detroit, delivered	12.25
Philadelphia, delivered	12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do. less than car lots	13.25c
Do. tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$29.00

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$25.00	$24.50	$26.00	$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65	.....	.....	28.15
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Birmingham, base	†20.38	†19.00	.....	.....
Baltimore, del.	25.67	.....	.....	.....
Boston, del.	25.12	.....	.....	.....
Chicago, del.	‡24.47	.....	.....	.....
Cincinnati, del.	24.30	22.92	.....	.....
Cleveland, del.	24.12	23.24	.....	.....
Newark, N. J., del.	26.24	.....	.....	.....
Philadelphia, del.	25.51	25.01	.....	.....
St. Louis, del.	‡24.12	23.24	.....	.....
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53	.....	26.53	26.03
Syracuse, del.	26.08	.....	27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38	.....	.....	27.38
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
Duluth, base	24.50	.....	25.00	24.50
St. Paul, del.	26.76	.....	27.26	26.76
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00	.....	24.50
Hamilton, O., base	24.00	23.50	.....	24.00
Cincinnati, del.	24.68	24.68	.....	25.35
Neville Island, Pa., base	24.00	23.50	24.50	24.00
‖Pittsburgh, del., No. & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00	.....	.....	.....
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50	.....	.....
Baltimore, del.	26.05	.....	.....	.....
Steelton, Pa., base	.....	24.50	.....	25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39	.....	26.39
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
Youngstown, O., base	24.00	23.50	24.50	24.00

*Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorus 0.70 and over deduct 38c. ‡Over 0.70 phos. ‖For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

High Silicon, Silvery

6.00-6.50 per cent (base)	$29.50		
6.51-7.00	$30.50	9.01- 9.50	$35.50
7.01-7.50	31.50	9.51-10.00	36.50
7.51-8.00	32.50	10.01-10.50	37.50
8.01-8.50	33.50	10.51-11.00	38.50
8.51-9.00	34.50	11.01-11.50	39.50

F.o.b. Jackson county, O., per gross ton, Buffalo base prices are $1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling irons, Nos. 5 and 6.)

Charcoal Pig Iron

Northern

Lake Superior Furn.	$28.00
Chicago, del.	31.54

Southern

Semi-cold blast, high phos., f.o.b. furnace, Lyles, Tenn.	$28.50
Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn.	33.00

Gray Forge

Neville Island, Pa.	$23.50
Valley, base	23.50

Low Phosphorus

Basing points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50 base; $30.81, delivered, Philadelphia.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorous Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorous content of 0.70% and over.

Manganese Differentials: Basing point prices subject to an additional charge not to exceed 50 cents a ton for each 0.50% manganese content in excess of 1.0%.

Ceiling prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Ceiling Prices: Pittsburgh Coke & Iron Co. (Sharpsville, Pa. furnace only) and Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic, Bessemer and Malleable. Mystic Iron Works, Everett, Mass., may exceed basing point prices by $1 per ton, effective April 20, 1942.

Export Prices: In case of exports only, the governing basing point nearest point of production may be used, plus differentials and export transportation charges.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	$64.60
First Quality	
Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00
Ohio	43.00
Second Quality	
Pa., Ill., Md., Mo., Ky.	46.55
Alabama, Georgia	38.00
New Jersey	49.00
Ohio	36.00
Malleable Bung Brick	
All bases	$59.85
Silica Brick	
Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30
Ladle Brick (Pa., O., W. Va., Mo.)	
Dry press	$31.00
Wire cut	29.00
Magnesite	
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00-25.00
Do., barge	23.00-25.00
No. 2 lump	23.00-25.00

(OPA May 11 established maximum at Jan. 2, 1942, level.)

Ferroalloy Prices

Ferromanganese: 78-82%, carlots, gross ton, duty paid, Atlantic ports, $135; Del. Pittsburgh $140.65; f.o.b. Southern furnaces $135; Add $6 per gross ton for packed carloads $10 for ton, $13.50 for less-ton and $18 for less than 200-lb. lots, packed.

Spiegeleisen: 19-21%, carlots per gross ton, Palmerton, Pa. $36.

Manganese Briquets: Contract basis in carloads per pound, bulk freight allowed 5.50c; packed 5.75c; ton lots 6.00c; less-ton lots 6.25c; less 200-lb. lots 6.50c. Spot prices ¼-cent higher.

Electrolytic manganese: 99.9% plus, less carlots, per lb. 42.00c.

Chromium Metal: Per lb. contained chromium in gross ton lots, contract basis, freight allowed, 98% 80.00c, 88% 79.00c. Spot prices 5 cents per lb. higher.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, f.o.b. Niagara Falls, N. Y. $2.25; less-ton lots $2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: 66-70%; per lb. contained chromium in carloads, freight allowed, 4-6% carbon 13.00c; ton lots 13.75c; less-ton lots 14.00c; less than 200-lb. lots 14.25c. 66-72%, low carbon grades:

	Car loads	Ton lots	Less ton	Less 200 lbs.
2% C.	19.50c	20.25c	20.75c	21.00c
1% C.	20.50c	21.25c	21.75c	22.00c
0.20% C.	21.50c	22.25c	22.75c	23.00c
0.10% C.	22.50c	23.25c	23.75c	24.00c

Spot is ¼c higher

Chromium briquets: Contract basis in carloads per lb., freight allowed 8.25c; packed 8.50c; gross ton lots 8.75c; less-ton lots 9.00c; less 200-lb. lots 9.25c. Spot prices ¼-cent higher.

Ferromolybdenum: 55-75%, per lb. contained molybdenum, f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Calcium Molybdate (Molyte): 40-45%, per lb. contained molybdenum, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, 80.00c.

Molybdic Oxide Briquets: 48-52%, per lb. contained molybdenum, f.o.b. Langeloth, Pa., any quantity 80.00c.

Molybdenum Oxide: 53-63%, per lb. contained molybdenum in 5 and 20 lb. molybdenum contained cans, f.o.b. Langeloth and Washington, Pa., any quantity 80.00c.

Molybdenum Powder: 99% per lb. in 200-lb. kegs, f.o.b. York, Pa. $2.60; 100-200 lb. lots $2.75; under 100-lb. lots $3.00.

Ferrophosphorus: 17-19%, based on 18% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrophosphorus: 23-26%, based on 24% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Mt. Pleasant, Tenn.; contract price $75, spot $80.

Ferrosilicon: Contract basis in gross tons per carload, bulk, freight allowed; unitage applies to each 1% silicon above or below base.

	Carloads	Ton lots
50%	$ 74.50	$ 87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

Spot prices ¼-cent higher.

Silicon Metal: Contract basis per lb., f.o.b. producers' plants, freight allowed; 1% iron; carlots 14.50c, ton lots 15.00c, less-ton lots 15.25c, less 200 lbs. 15.50c.

Silicon Metal: Contract basis per lb.; 2% iron; carlots 13.00c, ton lots 13.50c, less-ton lots 13.75c, less 200 lbs. 14.00c. Spot prices ¼-cent higher.

Silicon Briquets: Contract basis; in carloads, bulk freight allowed, per ton $74.50; packed $80.50; ton lots $84.50; less-ton lots per lb. 4.00c; less 200-lb. lots per lb. 4.25c. Spot ¼-cent per lb. higher on less-ton lots; $5 per ton higher on ton lots and over.

Silicomanganese: Contract basis freight allowed, 1½% carbon; in carloads per gross ton $128; ton lots $140.50. Spot $5 per ton higher.

Ferrotungsten: Carlots, per lb. contained tungsten, $1.90.

Tungsten Metal Powder: 98-99%, per lb. any quantity $2.55-2.65.

Ferrotitanium: 40-45%, f.o.b. Niagara Falls, N. Y., per lb. contained titanium; ton lots $1.23; less-ton lots $1.25. Spot 5 cents per lb. higher.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots $1.35; less-ton lots $1.40. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20%, Contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and North of Baltimore and St. Louis, 6-8% carbon $142.50; 3-5% carbon $157.50.

Ferrovanadium: 35-40%, contract basis, per lb. contained vanadium, f.o.b. producer's plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Vanadium Pentoxide: Technical grade, 88-92 per cent V_2O_5; contracts, any quantity, $1.10 per pound V_2O_5 contained; spot 5 cents per pound higher.

Zirconium Alloys: 12-15%, contract basis, carloads bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot $5 per ton higher.

Zirconium alloy: 35-40%, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot ¼-cent higher.

Alsifer: (Approx. 20% aluminum, 40% silicon, 40% iron) Contract basis, f.o.b. Niagara Falls, N. Y., per lb. 7.50c; ton lots 8.00c. Spot ½-cent higher.

Simanal: (Approx. 20% each silicon, manganese, aluminum) Contract basis, freight allowed, per lb. of alloy; carlots 10.50c; ton lots

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1942

	Soft Bars	Hot-rolled Strip Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars Carbon	Cold Drawn Bars S.A.E. 2300	Cold Drawn Bars S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.04	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	5.25	5.00	4.60	....	....
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	....	5.25	....	6.90	....	....
Seattle	4.20	4.25	5.45	4.75	4.45	6.50	4.65	7.60	5.70	....	5.75	....	....
Los Angeles	4.50	4.95	6.80	4.50	4.50	6.75	4.65	6.50	5.85	....	6.10	10.55	9.55
San Francisco	3.95	4.50	6.25	4.65	4.35	6.35	4.55	6.40	6.10	....	6.80	10.80	9.80

*Not named in OPA price order.

	S.A.E. Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.45	9.80	8.80	8.65	9.05

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-10,000 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 500-999, Los Angeles, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	L	s	d
Merchant bars, 3-inch and over	$66.50	16	10	0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20	0	0
Structural shapes	2.95c	15	10	0
Ship plates	2.90c	16	2	6
Boiler plates	3.17c	17	12	6
Sheets, black, 24 gage	4.00c	22	5	0
Sheets, galvanized, corrugated, 24 gage	4.61c	25	12	6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1	10	9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		L	s	d
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$25.79	6	8	0(a)
Basic pig iron	24.28	6	0	6(a)
Furnace coke, f.o.t. ovens	7.56	1	17	6
Billets, basic soft, 100-ton lots and over	49.37	12	5	0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14	10	6
Merchant bars, rounds and squares, under 3-inch	3.17c	17	12	0††
Shapes	2.77c	15	8	0††
Ship plates	2.91c	16	3	0††
Boiler plates	3.06c	17	0	6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22	15	0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26	2	
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23	15	0
Bands and strips, hot-rolled	3.30c	18	7	0

(a) del. Middlesbrough. 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.75
Old range nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.30

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% f.o.b. Rio de Janeiro	7.50-8.00c

Tungsten Ore

Chinese wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	$39.00
South African (excluding war risk)	
No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian (nominal)	
2.5:1 lump, 44%	28.50
3:1 lump, 48%	38.00

Manganese Ore

(Nominal)

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	
S. African, 48%	80.00-86.00
Indian, 50%	80.00-86.00
Brazilian, 46%	78.00-84.00
Cuban, 51%, duty free	85.00
Domestic, 48%, f.o.b. mines	$1.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

PRICES FOR OTHER THAN RAILROAD SCRAP

				ELECTRIC FURNACE AND FOUNDRY GRADES										
				Low Phos. Grades										
	OPEN HEARTH GRADES*	Machine Shop Turnings	BLAST FURNACE GRADES*	Billet, Bloom Forge Crops	Bar Crops and smaller: Punchings, Plate	Heavy Structural, Plate 3 ft. and less	Heavy Structural, Plate 2 ft. and less	Heavy Structural, Plate 1 ft. and less	Cut Auto Scrap 3 ft. and less	Cut Auto Scrap 2 ft. and less	Cut Auto Scrap 1 ft. and less	Alloy-Free Low Phos. & Sulphur Turnings	First Cut Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren	$20.00	$16.00	$16.00	$25.00	$22.50	$21.00	$21.50	$22.00	$20.00	$20.50	$21.00	$18.00	$19.50	$21.00
Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Bethlehem	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Buffalo	19.25	15.25	15.25	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Cleveland, Middletown, Cincinnati, Portsmouth, Ashland	19.50	15.50	15.50	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Detroit	17.85	13.85	13.85	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85
Toledo	.....	13.85	13.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicago	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Kokomo	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Duluth	18.00	14.00	14.00	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00
St. Louis	17.50	13.50	13.50	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif.	17.00	13.00	13.00	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	12.50	12.50	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50
Seattle	14.50	10.50	10.50	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50

RAILROAD SCRAP

	Heavy Melting Steel	Scrap Rails	Rails for Rolling	Scrap Rails 3 ft. and under	Scrap Rails 2 ft. and under	Scrap Rails 18 in. and under
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	21.00	22.00	23.50	24.00	24.25	24.50
Philadelphia, Wilmington, Sparrows Point	19.75	20.75	22.25	22.75	23.00	23.25
Cleveland, Cincinnati, Middletown, Ashland, Portsmouth	20.50	21.50	23.00	23.50	23.75	24.00
Chicago	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Kokomo	19.25	20.25	21.75	22.25	22.50	22.75
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00
Birmingham	18.00	19.00	20.50	21.00	21.25	21.50
Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Seattle	15.50	16.50	18.00	18.50	18.75	19.00

CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & Under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	17.00	18.00	19.00
Unstripped Motor Blocks	17.50	18.50	19.50
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Miscellaneous Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes states not named in groups A and B, plus Kansas City, Kans.-Mo.

*Open Hearth Grades refer to No. 1 heavy melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers' No. 2 bundles and No. 1 busheling. No. 1 chem. borings, 1 per cent oil, $1 under, No. 2, 1.5 per cent oil, $2 under heavy melting steel. No. 3 bundles, $2 under No. 1 heavy melting; cast steel, $2.50 over, tube scrap $3 over, auto springs, crankshafts, $1 over No. 1 heavy melting. Blast Furnace Grades refer to mixed borings and turnings, shoveling turnings, No. 2 busheling and cast iron borings.

A basing point includes the switching district of the city named. The Pittsburgh basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa. Cincinnati basing point includes the switching district of Newport, Ky. St. Louis basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill. San Francisco basing point includes the switching districts of South San Francisco, Niles and Oakland, Calif.

Inferior Grades: Maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. No premium allowed on grades considered superior, unless approved by OPA. Addition of special preparation charges prohibited. Purchase of electric furnace or foundry grades for open hearth or blast furnace use permitted only at no more than price for corresponding open hearth grade. Exceptions: Low phos. billet, bloom and forge crops and electric furnace bundles may exceed open hearth price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Commissions: No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or sub-broker, or with the consumer. Commissions must be shown as separate item on invoice.

Maximum Shipping Point Price: Where shipment to consumer is by rail, vessel or combination of both, scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel. In such cases, maximum shipping point prices are: (1) For shipping points located within a basing point, the price listed in the above table for scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point; and (2) for shipping points located outside a basing point, the price in the above table for scrap at the most favorable basing point, minus the lowest transportation charge by rail, water or combination thereof. When vessel movement is involved, dock charges shall be 50 cents at Memphis, $1 at Great Lakes ports, $1.25 at New England ports, 75 cents elsewhere. New England shipping point prices computed on most favorable basing point prices; maximum transportation charge on scrap from New England, $6.65 per ton.

Scrap shipped by motor vehicle is at its shipping point when loaded. For shipping points within basing points, maximum is price listed in table minus lowest switching charge. When outside basing point, maximum is price at most favorable basing point minus lowest established charge when hauled by common carrier. When hauled by seller charges are based on carload rate for rail shipment, minimum $1.00 per ton.

Maximum Delivered Prices: Determined by adding established transportation charges to shipping point price, not to exceed by more than $1 (plus freight rate increase March 18, 1942) the prices listed in the table for the nearest basing point. Certain exceptions specified in Revised Price Schedule No. 4 (Amendment 1) apply to St. Louis district consumers, to WPB allocations, to water shipments from Duluth or Superior, Wis., to shipments of billets, blooms and forge crops from Pittsburgh and to shipments of electric and foundry grades from Michigan; to shipments of turnings to ferroalloy producers and of borings to chemical users. Delivered prices of scrap shipped under WPB allocations may exceed prices at nearest basing point by more than $1, provided most economical transportation is used.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are $2.50 less (railroad grades $3.50 less) than for the corresponding grades of prepared scrap, except for heavy breakable cast. In no case shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Graveyard autos not considered unprepared scrap.

Remote Scrap: Consists of all grades, except railroad scrap, in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon, Washington, Louisiana, Utah. Delivered price may exceed by not more than $5 the price at the basing point nearest consumer's plant, provided sworn details furnished OPA. Permission required to exceed by more than $5 the nearest basing point price. Colorado scrap is remote scrap for Colorado consumers only.

Sheets, Strip

Sheet & Strip Prices, Page 134

Sheet producers have been hard hit for some time, not only by lack of semifinished steel but also by increasing diversion of mills to plate production. One large eastern producer will withdraw next month from the galvanized sheet market indefinitely, due not to lack of zinc but to insufficient steel for the priorities offered. In general, demand for galvanized sheets is light because of limitations on building construction. Sheet consumers find it difficult to obtain deliveries even on A-1-a priority.

Narrow cold-rolled strip bookings have declined mildly, shipments thus far this month being slightly ahead of new orders. Except where the steel has already been rolled, the volume being light, deliveries are confined to shipments covered by A-1-a ratings or better with priorities on much tonnage being revised upward under the new schedule. Specifications against old contracts are heavy. Annealing capacity is fully engaged and is a choke point on production with some mills, backlogs and new specifications running substantially to high carbon. Hot strip is available only on A-1-a or higher and re-rollers are barely able to maintain operations on current deliveries, some being forced to dip into low reserves. Thousands of tons of strip, including much stainless, are being offered from frozen stocks with little influence on re-rolling schedules, demand for new stock being entirely for war requirements.

Plates

Plate Prices, Page 135

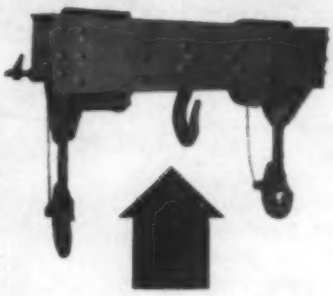
Steel plate production in June exceeded 1,000,000 tons for the second consecutive month and is expected to do even better in July. Practically all plate mills worked through the July 4 holiday and this month has one more day than June. Many observers believe plate output this month will reach close to 1,250,000 tons, though others believe this figure is too high. It is generally believed that by the end of fall monthly output will reach 1,400,000 tons, the goal now sought.

Nothing is being allowed to interfere with plate production, output of other carbon steel products being restricted where necessary. Provision for the heavy lend-lease shipments planned for the remainder of the year will cut into semifinished steel for general products.

While plate demand is unquestionably heavy, there are not the evidences of severe pressure witnessed during the spring. This is attributed to the increasingly smooth functioning of the allocation system in plates, with its accompanying check on inventories, and to the fact that the uses permitted are now about as definitely defined as possible, and to the fact also that production over recent months has been stepped up appreciably.

OPA has extended to Oct. 1 permission to sell distress stocks of steel and iron products at prices not more than 5 per cent higher

EUCLID CRANES
to Aid in Producing



A special 3 hook yoke to be handled by the 10 ton hoist. The center hook is used for general purposes while the two outer hooks, with safety latches, handle the bale of a large ladle, keeping it parallel with the runway of the crane.

ILLUSTRATED above is one of three cranes built to speed production in a modern plant producing armor plate for battleships, tanks, armored cars, etc.

These cranes embody all the approved conventional features plus refinements and improvements of exclusive Euclid design.

Special attention was given to assure ease and speed of control, safety to operators and workmen and long service through the use of liberally proportioned parts revolving in anti-friction bearings.

Each trolley is equipped with a 30 ton hoist and a 10 ton hoist which handles the rather unusual 3 hook yoke illustrated above.

Euclid manufactures traveling cranes in a full range of sizes and capacities and a complete line of electric hoists for every type of service.

THE EUCLID CRANE & HOIST CO.

EUCLID, OHIO, *Suburb of Cleveland*

than the domestic ceiling prices. The deadline previously had been July 1. The material includes products shipped for export before March 1, 1942, and shipments on the high seas and ordered back at the outbreak of the war. Sales can be made in the domestic market at the ceiling prices plus ocean freight and insurance, with storage or demurrage charges actually paid, up to 5 per cent of the domestic ceiling.

Bars

Bar Prices, Page 134

With heavy lend-lease allocations, largely for semifinished, steel supply for production of carbon bars has been reduced and further curtailment is expected. An important producer estimates that his August production of merchant bars will be reduced as much as 50 per cent for this reason, with substantial lowering during July.

While most carbon, cold-drawn and alloy bar tonnage entering into current heavy consumption is specified against forward war contracts, demand is active and orders are accepted with definite promise of delivery only against highest ratings or directives.

Warehouse replacements on re-extended ratings are below sales. Frozen bar stocks are being well absorbed where sufficiently high priorities apply, generally within the seller's district. Secondary distributors of bars are receiving directives for deliveries at points outside their usual territory. Sellers in the East will stock only a few grades of NE steels, hot and cold-rolled, mainly for heat treating and case hardening, although some will cover a wider range.

Pipe

Pipe Prices, Page 135

Some cast iron pipe foundries are booked ahead on A-1-a orders to November. Municipal and low-priority tonnages are light but requirements for airfields, training stations, bases and other government projects more than balance normal demands. A training station in New York requires 5200 tons of 12-inch, with considerable tonnage in other diameters. Pig iron allocations for these projects generally are sufficient.

Heavy demand for steel pipe for ship bunks and miscellaneous lots for ship railings are noted.

Tube mills supplying the aircraft industry are booked through the year, with little available for secondary sellers. Pressure for greater use of welded tubing for a larger number of fabricated products and aircraft, including gliders, is developing. Seamless tubing for the latter is in demand, principally 1½-inch for body and 2-inch for landing gear.

Maximum producer prices for "Victory" weights of cast iron soil pipe, the one weight produced for the duration of the war, have been established by OPA. This weight will replace the former standard, medium and extra heavy pipe. This pipe has been the only one produced since June 1, and all sales since that date have been subject to this price announcement. The new list provides a price of 33 cents per foot in 5-foot lengths of 2-inch single hub and 35 cents per foot for double hub. Prices increase with sizes to 15-inch at $6.10 per foot for single hub and $6.70 per foot for double hub. Allowable variation in weight is 5 per cent under or over the prescribed weight. Minimum base discount from list price on "Victory" pipe is set at 43½ off.

Wire

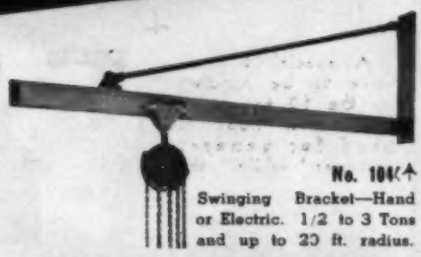
Wire Prices, Page 135

Heavy lend-lease commitments for third quarter, including substantial wire rod tonnages, are hampering finishing mill schedules and extending deliveries. Demand for specialties is heavy, orders below A-1-a being further delayed. Mills continue pressed to supply wire in sufficient volume to meet strong demand. Most rope mills are operating at capacity and are booked far ahead. Ratio of high-carbon business is large and heat treating capacity is fully engaged.

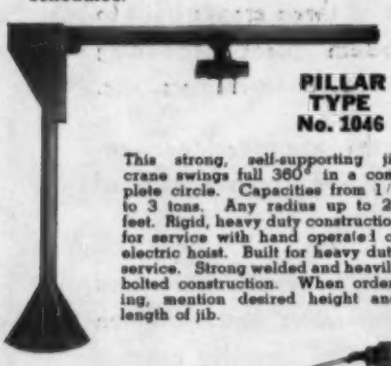
Production of nails is at an all-time peak with some producers and the swing toward wood construction

★ Speed War Production with
JIB CRANES
FASTER SAFER HANDLING AT LESS COST!

★ Make a quick survey of present handling operations in your plant, and you'll be quick to locate any slow production gaps. Consider then how these Jib Mounted Cranes (hand or electrically operated) will span those "in-between" spots and help you meet and even beat your war delivery schedules.

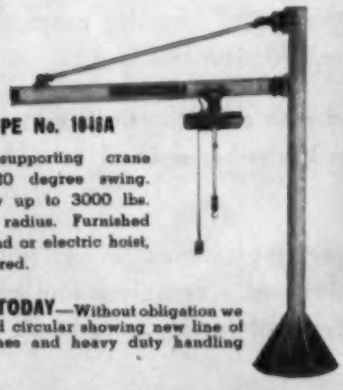


No. 184K
Swinging Bracket—Hand or Electric. 1/2 to 3 Tons and up to 20 ft. radius.



PILLAR TYPE No. 1046
This strong, self-supporting jib crane swings full 360° in a complete circle. Capacities from 1/2 to 3 tons. Any radius up to 20 feet. Rigid, heavy duty construction for service with hand operated or electric hoist. Built for heavy duty service. Strong welded and heavily bolted construction. When ordering, mention desired height and length of jib.

Chicago Tramrail Overhead Crane operating in Heat-Treating Room.



PILLAR TYPE No. 1048A
A self-supporting crane with 220 degree swing. Capacity up to 3000 lbs. with 14' radius. Furnished with hand or electric hoist, as required.

WRITE TODAY—Without obligation we will send circular showing new line of Jib Cranes and heavy duty handling units.

View of Chicago Tramrail Overhead Crane Installed in Large Steel Warehouse.

CHICAGO TRAMRAIL COMPANY
2912 CARROLL AVE. Phone KEDzie 7475 CHICAGO, ILL.

is reflected in nail demand. Barbed wire is largely allocated. Lack of shipping to South America is resulting in liquidation of considerable wire material originally destined for that delivery.

Emphasis is intensified on wire mill production by additional substantial forward orders for war requirements and lend-lease, finishing schedules being frequently readjusted to meet more important demand for specialties. Confronted with limited rod supply and a high ratio of high carbon and alloy volume requiring extensive processing and heat-treating, finishing departments are taxed to maintain deliveries on round wires.

Where possible, consumers are restricting or revising alloy specifications and mills are experimenting on numerous alternates under the national emergency steel specifications program, these in turn to be tested by consumers in finished products. For use in springs for armament equipment research is notable. Heavy demand holds for rope wire, stranding equipment being at capacity and more could be used if available.

Rails, Cars

Track Material Prices, Page 135

Indications are that approximately 400 steam locomotives will be placed with leading builders by the war department for construction over the remainder of the year, in addition to work definitely scheduled for this year for various railroads. Meanwhile, orders have been placed by the Denver & Rio Grande for six 44-ton diesel-electric freight and yard locomotives with General Electric Co., Schenectady, N. Y., and by the Central of Georgia for one 1000-horsepower diesel-electric switch engine with Electro-Motive Corp., La Grange, Ill.

Except for a fairly good number of small mine cars, car buying is at a virtual standstill, due to government limitations. However, Utah Copper Co. is said to be interested in the purchase of one hundred 100-ton ore cars, and the National Tube Co., in thirty 70-ton hopper cars.

Surplus freight car materials and parts sold by a car builder to another builder or railroad have been placed under a new schedule of maximum prices by OPA. Maximum prices may not exceed the total of net invoiced cost, inbound freight cost, direct labor cost of fabricating or finishing and state or retailers' occupational tax levied on such sale. Reports of such sales must be made to OPA by the middle of the succeeding month. This regulation, No. 174, supersedes all previous orders relating to such transactions.

A series of regional conferences last week, participated in by railroad and government officials and Army and Navy representatives discussed scrapping of obsolete equipment and a salvage checkup on rails used for other than trackage purposes. Meetings were under auspices of the industrial salvage section, Bureau of Industrial Conservation.

Structural Shapes

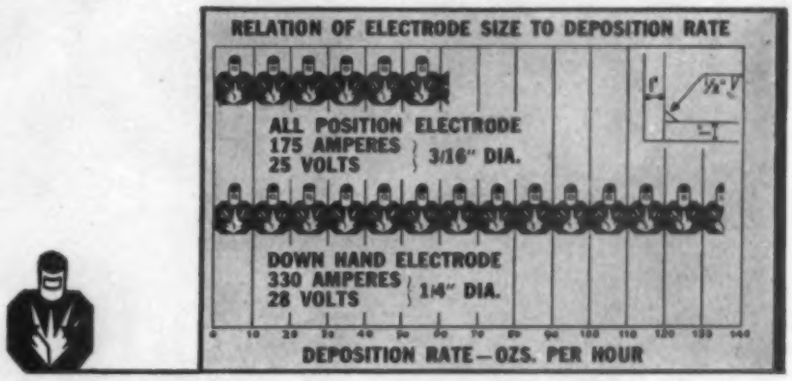
Structural Shape Prices, Page 135

With structural steel contracts for war plant construction and expansions curtailed, thousands of tons being eliminated, fabricators are bending efforts to obtain contracts for fabrication of war products. Contracts have been placed with several fabricators, acting as subcontractors, for prefabrication of a large number of marine lighters to be assembled at shipyards. These are for operation in shallow water, with steel frames and light steel hulls.

Other fabrication includes davits, deck equipment, ladders, platforms and railings. Portable cradles for servicing of aircraft engines in shop and field, assembled of light angles and channels, are being placed, one lot calling for 30,000, weighing about 800 pounds each. Movable antenna towers of junior beams and welded tubing are being fabricated. This class of work tends to increase demand for lighter sections, channels and angles rather than heavier sections.

Allocations of semifinished steel to structural mills are somewhat heavier, to ease the tightness in plain material, more directives, mainly for shipyards, being evident. At the current rate structural shops depending entirely on building contracts will need tonnage within the next six weeks or be confronted with curtailment of operations. Some war plant construction jobs

SUGGESTIONS TO HELP SPEED WELDED FABRICATION AND RELIEVE THE ELECTRODE SHORTAGE



In spite of the construction of new plants and tremendous increases in production, there is still a very definite shortage of welding electrodes.

The smaller sizes of electrodes and those of the all-position type cannot be manufactured as fast as the larger sizes and those with all-mineral coatings.

Electrode users can, therefore, help relieve the electrode shortage by using sizes as large as practical and by planning their work, so that whenever possible the all-mineral coated rods can be specified.

Using the larger diameter electrodes increases the speed of fabrication, too. For normally, when proper currents are used, the greater the electrode diameter, the higher is the resulting deposition rate. As shown in the above chart, in joining 1" plate with a ½" fillet weld, a 3/16" all-position rod deposits only 62 ounces of metal per hour, whereas a ¼" downhand "hot" rod at 330 amperes, deposits 135 ounces per hour, an increase of over 117%.

Murex engineers are available for consultation to manufacturers who are directly or indirectly engaged in war production—whether or not they are users of Murex electrodes.

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

METAL & THERMIT CORP.
120 BROADWAY • NEW YORK, N. Y.

MUREX
ARC WELDING ELECTRODES

Albany • Chicago • Pittsburgh • S. San Francisco • Toronto

have been held up by pressure for shipbuilding material and WPB has issued directives to keep this material moving.

Reinforcing Bars

Reinforcing Bar Prices, Page 135

Demand for reinforcing steel is light, with few awards and little inquiry. Placings are small and for war projects and essential plant expansions, all carrying high priority ratings. Open bids have been largely done away with, selected mills and suppliers often being asked merely to file quotations. Bar mills are limited as to output because of semifinished steel shortage, consequently are not in a position to compete. Important lots of bars usually are obtained through directives, A-1-a's no longer having worthwhile standing.

Maximum prices on any shipment of fabricated concrete reinforcing bars under lump sum contracts after June 15 is the price established in regulation 159 by OPA. This regulation cuts across all contracts, lump sum or otherwise, in effect on that date.

Pig Iron

Pig Iron Prices, Page 136

Pig iron distribution is being maintained satisfactorily in most instances and war needs are being met. Requirements of foundries engaged in essential production, such as machine tool castings and cast iron pipe for government projects, are taking large tonnages. At the same time many gray iron foundries unable to obtain essential war work are operating at reduced rate and require little iron.

Need for relining has resulted in a few stacks being idle but others on which repairs have been completed have been returned to service. Unusual production is being maintained and total output is at a high level. One stack of Bethlehem Steel Co. made over 43,000 tons in June, which is close to the best world record. The smaller of the two stacks at Swedeland, Pa., which was blown out for repairs July 6, is expected back in operation within a month. Another eastern Pennsylvania blast furnace which has been idle since 1930 is scheduled for immediate lighting on basic iron. Requests for August deliveries in the East were as heavy as for July, increased demand for basic offsetting the moderate drop in foundry requirements.

Scrap

Scrap Prices, Page 138

Inauguration of the nation-wide salvage program, starting July 13, is expected to aid the scrap situation materially, as the weight of government agencies will be behind it. Advertising will tend to make the public scrap conscious and efforts by the agricultural implement industry will reach out into the agricultural regions to dislodge material known to lie dormant. Intensification of all state and local salvage organizations will put pressure on holders, in an effort to scrape bottom.

Floods continue to restrict shipments of scrap to the St. Louis district, though conditions are improving. Directives cover a large portion of the available material and little is left for further sales, difficulty being experienced in meeting

Tool Steel Scrap

Cents per pound, to consumers f.o.b. shipping point

Tungsten Types

(For each 1% tungsten contained)

Solid scrap containing over 12%	1.80
Solid scrap containing 5 to 12%	1.60
Turnings, millings containing over 12%	1.60
Do., 5 to 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 1% vanadium	13.50
Turnings, millings, same basis	11.50

Mixed Scrap

(Molybdenum and Tungsten Types)

Solid scrap, each 1% contained tungsten	1.60
Solid scrap, each 1% molybdenum	.80
Millings, turnings, each 1% tungsten	1.40
Millings, turnings, each 1% molybdenum	.70

all allocations. Steel production is maintained at the expense of such reserves as had been accumulated.

Buffalo dealers are receiving record tonnages of scrap from plants fabricating steel but supply of yard scrap is not holding up to previous marks. The former condition results from increased production of war goods and the latter to the fact that efforts at collection have exhausted some sources.

Salvage authorities have been appointed in more than 350 plants in the Detroit district and results are appearing. In one plant red tags were supplied, the workers attaching them to equipment and material they considered scrap. This company's gray iron foundry, closed for lack of war work, yielded 1500 tons of pig iron and a large accumulation of scrap. In the first week of this company's salvage operations 578 tons was obtained. A group of employes went on a week-end scouting expedition and discovered a 50-mile abandoned railway line, which was reported to the salvage authorities.

A large scrap operator in the East has received better shipments this month than the average during June, but this is an exception to the general trend. Foundry scrap movement in that area is better but a stringency in steelmaking grades is increasing.

In the Pittsburgh district no open hearths are idle for lack of scrap but complaint is made of the quality, which is claimed to reduce steel output by requiring longer processing in the open hearth. Supply is not sufficient to allow accumulation for winter use.

Reports to the Chicago industrial salvage section of WPB show the ten states in that district collected from industrial plants during the last two weeks of June 135,200 tons of scrap. Illinois led with 89,700 tons, followed by Wisconsin and Upper Michigan 33,200 tons, Minnesota 1425 tons, South Dakota 1000 tons, North Dakota 175 tons, Nebraska 11 tons, Iowa 13 tons, Missouri 7900 tons, Kansas 1800 tons and Indiana 150 tons.

Second avenue elevated structure now being wrecked in New York will yield 25,000 tons of scrap material, of which 5000 tons is rails and of the remaining 20,000 tons more than 80 per cent is wrought iron suitable for rerolling. The quantity of steel for furnace melting will be relatively small. When the structure was erected 60 years ago wrought iron was used and the steel content is mainly that placed for repairs and modernization.

Barge shipments from New England to Jersey City, N. J., for transshipment by rail to eastern Pennsylvania continue and movement to Buffalo by barge canal from Hudson river points is substantial.

Warehouse

Warehouse Prices, Page 137

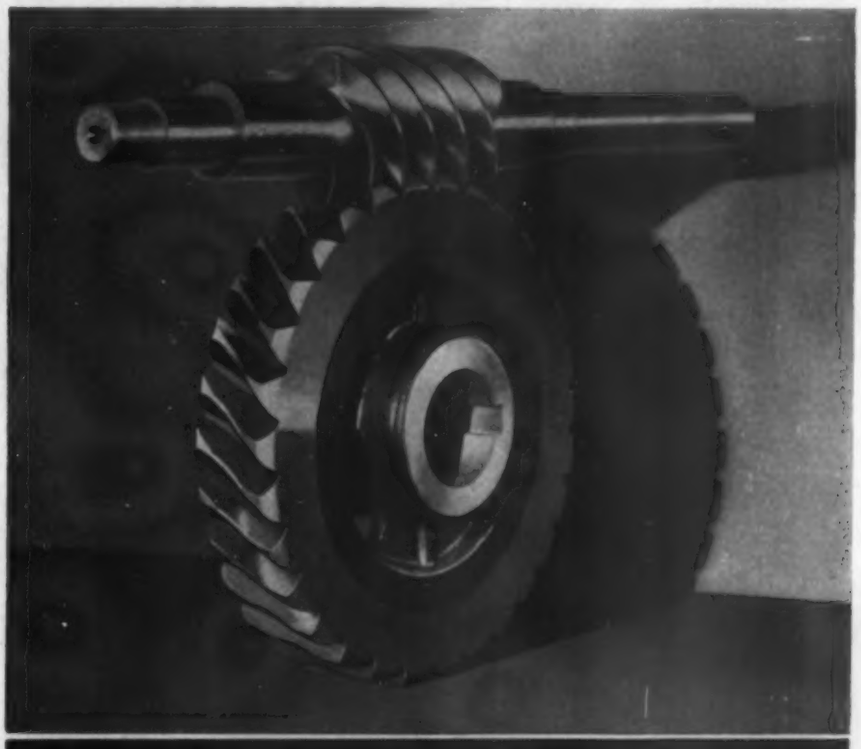
Warehouse sales in June did not drop sharply from May but the decline was pronounced as compared with a year ago. A leading distributor estimated the loss at one-third and regards this as reasonable, as a year ago steel was not limited to emergency requirements and also there was less certainty as to the extent of emergency needs and much overbuying was done.

Hope is entertained that efforts of the warehouse unit of WPB may result in better supply from mills as a result of realization of the critical situation. War production in many instances has been held up by inability to obtain necessary steel, requirements being in lots too small for mills to accept. Distributors are receiving the first lots of NE steels, which will substitute for many of the older analyses of alloy steel.

Pacific Coast

Seattle—Jobbers complain their situation is becoming more critical with record demands for all items and inability to supply essential industries. Priorities ratings are being raised, adding to warehouse problems. Stocks are receding and replacements almost impossible. Even the local mills cannot supply jobbing houses as the former's ratings are so high.

Rolling mill operators have not yet received definite interpretations of OPA regulations covering reinforcing bars and are working under their own understanding. Mills are producing a large volume of mer-



For Action that's ACCURATE

★ When action is demanded for transmitting power, here's accuracy to better than one-thousandth of an inch . . . precision is one feature of all Horsburgh & Scott Worms and Worm Gears. There are seven outstanding features that make Horsburgh & Scott Worms and Worm Gears the finest obtainable . . . it will pay you to learn about these advantages.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

chant bars required in shipbuilding and are accepting only business that carries highest ratings.

The scrap campaign is still bearing fruit with materials coming from heretofore unexplored sources. In spite of maximum consumption, mills were able to increase inventories slightly last month. What will happen when surplus supplies have been exhausted and unfavorable weather interferes with collections is a problem.

Although the Kaiser shipyard at Swan Island has not been completed, the first keel of 56 530-foot tankers for the Maritime Commission was laid last week. The initial launching from the eleven shipyards is scheduled for December.

Pacific Northwest Advisory Board estimates third quarter car loadings in Washington, Idaho and Oregon 5.1 per cent higher than in the corresponding period in 1941. Mine products will be down 26.5 per cent but large increases are predicted in agricultural products, construction and building materials and fir lumber, the latter figured at 146,080 cars, an increase of 10 per cent.

Willamette Iron & Steel Corp. plans a $5,000 000 floating drydock and marine railway, wooden, on the Willamette river at Portland, Oreg.

Washington state has called bids July 18 for sale of remaining salvage of the Narrows bridge, including two main cables, two towers and other steel sections, tonnage unstated. The state has taken a loss of $2,216,746 on the $6,423,079 structure.

Kuney Johnson Co. has the contract at $236,315 to add 36 grain bins to the elevator of the Port of Seattle, involving 300 tons reinforcing.

United States engineer, Portland, has received bids for sewer, water and facility systems at two ordnance bases. The Seattle office is negotiating a contract for construction of shops and other utilities and has awarded a $1.000,000 building project to Moore & Roberts. Other contracts for buildings and facilities have been placed with MacRae Bros. and W. G. Clark, Seattle, details not announced.

Cast iron pipe stocks are short and replacements uncertain, deliveries on highest priorities being 90 days or more, all materials now coming overland. Marckmann & Williams, Seattle, will supply 1000 tons of universal pipe for a housing project at Manette, Wash. Bremerton, Wash., will open bids July 15 for about 250 tons of 24 and 16-inch supply lines, with alternates, a unit of the city's $417,000 system project. Several housing contracts, involving sizable tonnages, are pending.

Canada

Toronto, Ont.—Canada is beginning to find more of a pinch in supplying iron, steel and other metals urgently needed under its war production program and indications point to greater pressure as the war progresses and new secondary plants start production. At present Canadian steel mills are maintaining production to the limit of capacity, but with expanded facilities in process of installation at various steel plants, it is expected that steel capacity will be increased another 25 per cent before the end of the year. Dominion Steel & Coal Corp., Sydney, N. S., and Steel Co. of Canada Ltd., Hamilton, is proceeding with new open hearth installation, while other large additions are underway at Sault Ste. Marie, as well as at other points.

General stiffening in priority regulations go into effect immediately. These will be directed to imports of steel and metals from the United States, as well as to the domestic supply. Under the new plan it is believed many Canadian plants will be forced to close down entirely through lack of raw materials. However, Canada is speeding war materials production and only civilian or non-essential industry will be affected. Plans also have been announced for general increase in this country of base metals of all kinds, with special assistance promised both by the Canadian and United States governments in this respect.

About the only inquiry receiving attention is that directly associated with the war and from customers enjoying top priority ratings. It is expected the swing over to United States methods of distribution, announced last week, will tend to clear the air in some respects in placing of new steel orders. While there

DOUBLED CAPACITY FOR WAR PRODUCTION

Stepping up our productive capacity month after month has barely enabled us to keep pace with mounting war orders. As long as this condition exists, it becomes increasingly difficult to meet civilian requirements. Our one big job is the handling of war material. That job must come first.

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Keeping supplies, parts and materials moving freely to and from high-speed processing equipment is an important key to increased man-and-machine-hour production. This continuous flow eliminates bottlenecks . . . reduces worker fatigue . . . and enables you to achieve maximum production.

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Field Engineers and Sales Offices located in 30 Industrial Centers.

has been a sharp decline in ordinary civilian business, war contracts are gaining in volume.

Plate and sheet production is topping all previous records and even with the greatly enlarged output of these materials demand is well in excess of supply. In most plants, however, sufficient plates are being received to enable steady operations and Canada is planning to increase shipbuilding activities. Tank construction also is on a steadily expanding scale. Plates and sheets for other consumers, however, are not available, although some supplies are being shipped to freight car builders for urgently needed railroad supplies. All orders for sheets and plates are said to be clearing through the steel controller's office. Imports also are holding at record levels.

Inquiries for merchant bars are in large volume and despite the fact that producers show no interest in sales to non-war plants, delivery promises on new orders extend several months and some mills report backlogs that will take all output for first quarter. Current bookings, however, are on an if, as and when basis for delivery.

Despite sharp falling off in new construction projects in the past month or six weeks, structural steel lettings continue at a high rate. Awards last week were about 12,000 tons. with a total running close to 50,000 tons pending in connection with various jobs, all approved by the government.

While scrap offerings are at about the average for previous weeks, a survey of the rural districts recently indicated that a large part of the accumulations now have been cleaned out and local dealers look for early slowing up in shipments. Large quantities of scrap still are available from local dealers and scrap is being rushed through yards for delivery to consumers. Consumers stocks also have been substantially increased recently but there is no decline in demand. Mills, electric furnaces, and foundries are taking all offerings in an effort to guard against shortages later in the year.

Equipment

New York—Machine tool deliveries, keyed to the official urgency list, are expedited to the aircraft industry, frequently at the expense of others. New buying continues brisk with demand for aircraft and affiliated shops taking a substantial ratio of the volume. Directly negotiated contracts by government departments are also numerous. Shops in most instances have cleared the confusion resulting from the rush of buying several months ago; some orders were dropped, others reduced while, on the other hand, supplemental business was placed by some. Large inquiries are out for several propeller plants to be operated by a typewriter and office equipment builder.

Boston—Machine tool builders in many instances have dropped temporarily from their lines the less active units or those not fitting into war production, concentrating on tools required for the latter. Production at some shops has attained record peaks and are mounting, builders having taken additional factory space where available in addition to utilizing expansions to their own plants, while hundreds of thousands of man-hours work is being sublet by firms ordinarily doing little.

New buying, direct and through negotiated contracts, while below the pre-April rate, continues brisk. Requirements for aircraft, direct and indirect, are substantial and are given first consideration as to deliveries. Backlogs are more stable with the filtering out of the water in orders placed last spring. Some indication of production increase may be seen in one shop's quota of 500 machines monthly ultimately whereas normally 80 units per month were considered top. Cutting tools and fixtures, reamers, drills, cutters, taps and dies are tight, and in some cases machines are being shipped without some fixtures, engineering details being supplied the buyer for purchase of the parts direct.

Seattle—The situation is so critical that scrap heaps are being combed for equipment that can be reconditioned and pressed into service. Earth moving and heavy items are in particular demand. Seattle has

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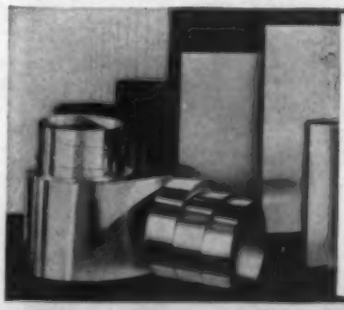

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announced that no further water service installations will be made without permission of FHA.

In Montana the army has requisitioned the highway maintenance equipment of Nelson Smith, a contractor who has just taken a $55,560 state highway job, requiring it for construction of a military project in Montana. Tacoma has awarded a contract to Westinghouse at $13,885, for furnishing lightning arresters for the Nisqually power project. Spokane county, Washington, has purchased a diesel crawler-type tractor with hydraulic bulldozer, from Hofius Ferris Equipment Co. C. A. A. will open bids at Washington, D. C., July 9 for three power distribution cabinets, delivery at Seattle, No. 1568.

Steel in Europe

Foreign Steel Prices, Page 137

London—(*By Cable*)—Steelmakers in Great Britain are encountering brisk call for steel plates and sheets. Heavier tonnages of bar sections are needed for colliery work and railroad maintenance. Special steels and alloys are urgently needed for munitions and aircraft production. Structural steel is in lighter demand. Activity in tin plate is restricted.

Priorities—Allocations—Prices; Late Amendments

(*Concluded from Page* 55)

including distress and liquidation sales and sales by persons who, because of priority orders or for other reasons, cannot use such materials in regular course of their business.

No. 49 (Amendment) —**Resale of Iron or Steel Products,** effective July 11. Extends from July 1 to Oct. 1, time limit within which distress stocks of iron and steel subject to this schedule may be sold at special prices.

No. 93 (Amendment)—**Mercury,** effective July 7. Interprets schedule to cover every grade and kind of mercury sold in 76-lb flasks. Prices apply pro rata to mercury sold in all containers of more than 25-lb. capacity.

No. 100 (Amended)—**Cast Iron Soil Pipe and Fittings,** effective as of June 1. Establishes prices for "Victory" sizes of pipe and revises method of determining maximum delivered prices for all weights of pipes and fittings, when shipped in less-carload lots.

No. 173—Wheat Millfeeds, effective July 4.

No. 174—Freight Car Materials, effective July 2. Establishes maximum prices for surplus car materials sold by one builder to another or to a railroad as the total of the following: Selling car builder's net invoiced cost or maximum price otherwise established by OPA for purchase of such material, at the time of sale pursuant to such Order No. L-97-a-1, as amended, whichever is lower; inbound freight paid by seller; direct labor costs, if any, in fabricating such material, determined on basis of labor rates of Oct. 1, 1941; and state sales or retailer's occupational tax levied on such sale.

No. 175—Rolled Glass, effective July 11. Establishes specific maximum prices for producers of rolled and wire glass, principally at Oct. 1-15, 1941 levels.

No. 176—Rotary Cut Southern Hardwood Box Lumber, effective July 11.

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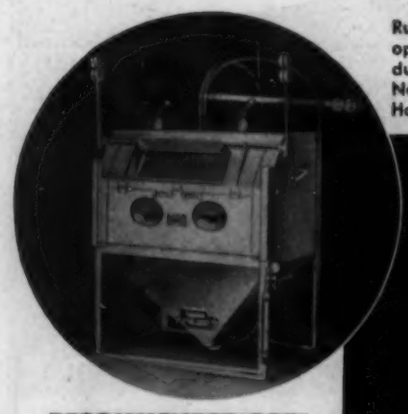

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2. Aircraft production—cleaning welds, metal preparation.
3. Foundries, ferrous and nonferrous — cleaning castings.

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Ruemelin cabinet with door open. Provides quick access for loading and unloading.

RUEMELIN Blast Cleaning Cabinets

Nonferrous Metal Prices

July	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-9	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, l.c.l.	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

Magnesium

(12 pound rod, 4 in. diam.)

99.8% ingot, carlots	22.50
100 lb. to carlots	24.50
Extruded sticks, ¼ to 2 lb.	
Carlots	32.00
100 lb. to carlots	34.00

OLD METALS

Dealers' Buying Prices

(In cents per pound, carlots)

Copper

No. 1 heavy	9.25-10.00
Light	7.25- 8.00

Brass

No. 1 composition	8.75- 9.50
Yellow brass castings	5.50- 6.25
Auto radiators	6.50- 7.25
Red Brass, borings & turnings	8.50- 9.25

Zinc

Old	5.00- 5.75
New clippings	6.50- 7.25

Aluminum

Clippings	10.00-10.75
Cast	8.75- 9.50
Pistons	8.75- 9.50
Sheet	9.00- 9.75

Lead

Heavy	5.00- 5.50
Mixed babbitt	4.50- 5.25
Electrotype shells	5.00- 5.75
Stereotype, Linotype	6.25- 7.00

Tin and Alloys

Block tin pipe	44.00-46.00
No. 1 pewter	32.00-38.00
Solder joints	7.75-10.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	13.25
Standard No. 12 aluminum	14.50

Nonferrous Metals

New York—Bans against publication of certain metal statistics have been tightened by the Office of Censorship. Data covering primary zinc and lead metal and their ores will not be available for public circulation for the "duration." Lack of statistical information should not prove disturbing, however, under present controlled market conditions.

WPB has issued Priorities Regulation No. 13 which establishes new rules governing sales of idle inventories dammed by various prior provisions.

Copper—Methods of increasing production of usable copper from yellow brass scrap are being discussed. Plans are being considered for ingot makers and smelters to make black copper which would be sent to smelters with unused capacity for conversion into 98 per cent blister copper and subsequently to refineries for final treatment. It is estimated that between 10,000 and 15,000 tons of new copper per month might be turned into war production if this program can be worked out.

A downward revision of brass ingot prices is expected to be made by OPA within 10 days.

Lead—Monthly lead pool, heretofore established by a separate order each month, has been made constant until further notice at the unchanged rate of 15 per cent of the quantity produced in the two months preceding.

Zinc—Sales of slab zinc increased sharply during the week ended July 4, but due to cancellations and steady shipments the order backlog declined. The supply situation continues to improve.

Metallurgical Coke

Coke Prices, Page 135

Beehive coke sellers find consumer specifications have eased somewhat, permitting shipment of coke which previously would have been rejected. This provides some relief for producers unable to obtain top quality coal at a price allowing a profit at ceiling coke prices.

Beehive coke operators have difficulty in keeping coal stocks sufficiently high for safety, some having only a week's supply.

WHAT OF WIRE TODAY?

Yes! WHAT OF WIRE?

The immediate prospect is for little, *if any*, improvement in the delivery or allocation conditions. Be Scotch with your handling of the wire you need. Plan its use. Cut waste.

In Shaped Wire if you have not already adopted standard shapes and analyses, it will be prudent to do so at once.

For General Wire check to see that your requisitions are cut to an irreducible minimum.

For Welding Wire use correct analyses and proper size—lean toward larger sizes. Don't permit bending of electrodes. See that each one is used right down to the holder—and that there is no wasteful excess deposit in the weld.

If we can cooperate in any way, call on us—remembering that we operate in the sincere belief that we serve you best by allowing nothing to interfere with giving the wire needs of the armed forces first call on our production.

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SUB-CONTRACT OPPORTUNITIES . . .

Data on subcontract work are issued by local offices of the Contract Distribution Branch, WPB. Contact either the office issuing the data or your nearest district office. Data on prime contracts also are issued by Contract Distribution offices, which usually have drawings and specifications, but bids should be submitted directly to contracting officers as indicated.

Detroit office, Contract Distribution Branch, Production Division, WPB, Boulevard building, is seeking contractors for the following:

Job No. 1199: Washer, exhaust valve spring lower, PWA No. 824 steel. Material is furnished, 2-inch stock. Automatic screw machine. HD drill, etch, polish stand. Quantity 50,000, on A-1-a priority.

Job No. 1200: Washer, inlet valve spring lower, PWA No. 187 steel, 2-inch stock. Automatic screw machine, HD drill, marking, machining, hone hole and polish stand operations required. Order for 50,000 for delivery as soon as possible on A-1-a priority.

Job No. 1201: Shaft, rear counter shaft, gear, PWA No. 815A steel. Material is furnished, 1⅝-inch stock hand screw machine preferred, sensitive drill, external grinder and lathe are required. Quantity, 5000 as soon as possible on A-1-a priority.

Job No. 1202: Spacer, impeller shaft front, PWA No. 815A steel. Material is furnished, 3¼-inch hand screw machine, broach, burnish, lathe, mark roll, internal grinder, hardening, sensitive drill and tin plate. Quantity 5000 as soon as possible on A-1-a priority.

Job No. 1203: Housing. Material aluminum alloy, class 8, available. Equipment required, lathe, with pot chuck, sensitive drill, tapper, diamond boring machine, lathe with angle plate fixture, horizontal boring machine. Order is for 6000 at monthly rate of 1250, complete before Nov. 1. Sample and blueprint at exhibit room.

Job No. 160: Connection ends. Local prime contractor needs immediately sources for production of 600,000 pieces on schedule of 50,000 per month. Prefers subcontractor to furnish forgings and machining but will furnish forgings. Blueprints and samples at exhibit room. Can be produced on heavy duty drill.

Job No. 1285: Micrometer index, SAE X No. 1315 steel. Equipment, turret lathe, 4 x ⅝-inch, internal and external grinders, milling index head. Quantity, 500 on fast production, on A-1-a priority.

Job No. 1340: Adapter. Corrosion resisting steel. Equipment, 2⅛-inch O.D. material, screw machine, milling, sensitive drill, tapper and external grinder. Quantity, 10,000 required as soon as possible on A-1-a priority.

Job No. 1341: Seat, needle valve, AMS No. 6540CD, stainless steel, ⅝-inch hex. Equipment, screw machine, sensitive drill, polish hex, immunize. Quantity, multiples of 5000 pieces for delivery as soon as possible to total of 75,000 on A-1-a priority.

Job No. 1342: Sleeve, SAE No. X-1314 C.R. steel, ⅞-inch material. Equipment, automatic screw machine, external grinder, radius. Quotations desired for delivery of 50,000 per week, to start in August for total of 100,000 to 200,000 on A-1-a priority.

Job No. 1343: Stem, ball joint, 11/32-inch O.D. material, type No. 303 cold-worked stainless steel. Equipment, screw machine, centerless grinder. Order is for multiples of 5000 for delivery as soon as possible for total of 75,000.

Job No. 1344: Pin (float), ⅜-inch material, round rod stainless steel, cold drawn. Equipment, screw machine, centerless grinder, immunize. Multiples of 5000 for immediate delivery to total of 25,000.

Job No. 1345: Plug, taper seat, ⅞-inch O.D. material, AMS No. 5610 C.D. stainless steel rod. Equipment, automatic screw machine, sensitive drill, milling. Lots of 25,000 to 100,000 pieces for total of 250,000.

Job No. 1346: Pin (Mix. control), ¾-inch material, AMS No. 5610 C.D. stainless steel. Equipment, automatic screw machine, heat treating processing, centerless grinder. Lots of 25,000 to 100,000 for total of 250,000.

Job No. 1347: Needle, ⅛-inch round stainless steel. Equipment, screw machine, centerless grinder. Delivery as soon as possible in multiples of 5000 for total of 75,000.

Job. No. 1348: Driven gear bearing, rear, bronze material. Castings are furnished, 1⅛-inch O.D. material. Equipment, screw machine, milling, external grinder, key cutter. Order is for 50,000 at minimum of 1500 per week on A-1-a priority.

Job No. 1349: Boom pivot. Local prime contractor seeks machining facilities. Material, steel castings. Drill jigs are furnished. Equipment, turret lathe, 15-inch diameter, H.D. drill, tapper, milling, keyway machine. Total order for 1000 at 150 per month beginning Aug. 1.

Job No. 1350: Boom pivot. Local prime contractor seeks machining facilities. Material is steel castings. Drill jigs are furnished. Equipment, planer, vertical boring mill, tapper, key seater. Order for 1000 at 150 per month beginning Aug. 1.

Job No. 1355: Pressure tank plug, forgings only. Steel forging SAE No. 1030. Order for 161,000 on delivery of 1200 to 2500 per day. No machining.

Job No. 1356: Strainer base, forgings only, steel forgings SAE No. 1030. Order for 161,000 pieces at 1200 to 2500 per day. No machining.

Job No. 1353: Accessory drive shafts. AMS No. 6250 steel, which is furnished. Lathe cut off and center, lathe, converted to gun drill, lathe, heat treating, straightening press, external grinder, sensitive drill and hobber. Quotations asked on 100, 300 or 500 monthly on A-1-a priority.

Job No. 1354: Accessory drive shafts, No. 3140 bar stock steel, which is furnished. Lathe cut off and center, lathe convert to gun drill, lathe, heat treating, straightening press, external grinder, sensitive drill, hobber and hand mill. Quotations asked on 100, 300 and 500 per month on A-1-a priority.

Job No. 1362: Ventilated disc assembly. Prime contractor wishes to locate production facilities. All material, comprising completed assemblies, is furnished, including castings and forgings. Equipment required is riveting hammer, surface grinder, balancer, lathe with 12-inch swing, H.D. drill, lathe with 18-inch swing. Order is for 1500 pieces per month of completed assembly. Priority varies, lowest A-1-j. Sample at exhibit room.

Philadelphia Office, Contract Distribution Branch, Production Division, WPB, Broad Street Station Building, reports the following subcontract opportunities:

Cruse-38-1: Pennsylvania manufacturer seeks subcontracting facilities for 52 cylinder covers and 52 cylinder bases. Material, cast steel and cast iron, to be furnished by prime contractor. Tolerances, .002. Quantity, 104. Production to start as soon as possible. Equipment required, all tools and jigs, 6-inch planer, 80-inch radial drill, annealing ovens. Prints and specifications at Philadelphia office. Parts can be inspected at plant.

Eser-38-1: Pennsylvania concern seeks subcontracting facilities for manufacture of coupling sleeves (forgings) 23⅜ inches diameter and coupling cover plates (forgings) 22⅛ inches diameter. Jigs and material (40-50 carbon steel, American shipping grade No. 2) to be furnished by prime contractor. Priority rating A-1-a. Equipment required, drill presses, lathes, inside boring and outside turning. Delivery to begin Oct. 15 and six pieces per month will be needed. Prints at Philadelphia office.

Eser-38-2: Ohio company requires subcontracting facilities for locking rings. Material, steel, WAS 57-107-12. Equipment needed, broaching machine or four or six-spindle Acme, Gridley, Cleveland or Davenport automatic turret lathe. A-1-a priority. Quantity 36,000 at rate of 500 per day.

Eser-38-3: Indiana manufacturer desires to locate contracting facilities for driving discs, subassembly of driving plate, driving ring, coil core, housing, worm and cam, worm gear and shafting. Material, ½-inch to 2½-inch steel bars, SAE x 51410, Carpenter No. 5 or equivalent. Equipment, gear cutting, screw machines, key seating, lathes and surface grinding. Delivery, immediate. Prints at Philadelphia office, samples at exhibit room.

Jackson-33-1: Michigan manufacturer requires subcontracting for aviation motor components. Plain and stepped

studs, square and hex head bolts, castle and sleeve nuts, taper and special pins, special screws and bushings, washers, plugs, caps, nipples, rocker shafts, cam shaft rocker tappets, etc. Quantities, varying, minimum 14,000 of each of more than 100 different items. Material mostly AMS 6310 and 5024 steel bar. Minimum tolerance .001. Equipment required, or equivalent, screw machines, light milling machines, drilling, precision grinding, heat treating, hardness testing, cadmium plating. Prints, specifications, samples and information at Philadelphia office.

Jackson-35-1: Government requires prime contractors for forge lapwelded tanks, 3 x 7 feet, tested for 500 pounds pressure. Facilities, forge lapweld equipment and electric welding equipment, ICC specifications. Prints and specifications at Philadelphia office.

Jackson-38-1: Pennsylvania prime contractor desires to contact experienced die makers with facilities to subcontract numerous dies. Prints and specifications at Philadelphia office.

O'Hara-26-1: Pennsylvania firm requires subcontracting facilities for cylinder frames. Requirements, large planers, 18 to 20-inch stroke and No. 4 heavy millers. Material furnished by prime contractor.

O'Hara-26-2: Pennsylvania company wishes to locate subcontracting facilities for heavy casting work. Requirements, vertical boring mills that will swing 13½ to 14 inches. Fairly close tolerances. Also calls for repairing and annealing. First castings will be ready about July 15. Material to be furnished by prime contractor.

O'Hara-37-1: Pennsylvania concern is seeking subcontracting facilities for machining of high, low and intermediate cylinders of triple-expansion engines in diameters of 24½, 37½ and 70-inch bore. Equipment, vertical boring mills 8 feet and over, with 10-foot head clearance, horizontal boring mills with 4 to 6-inch bars and 4 x 12-foot planers.

STRUCTURAL SHAPES .

SHAPE CONTRACTS PLACED

5000 tons, building, arsenal, New York, to Bethlehem Steel Co., Bethlehem, Pa.

700 tons, expansion, Ingalls-Shepard Division, Wyman-Gordon Co., Harvey, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.; R. H. Maveety, Chicago, structural engineer.

500 tons, addition, Kankakee Ordnance Works, Illinois, for war department, to Duffin Iron Co., Chicago.

450 tons, power house, Republic Steel Corp., Chicago, to Duffin Iron Co., Chicago; James Stewart Corp., Chicago, contractor.

279 tons, Independence avenue bridge, Washington, to Des Moines Steel Co., Des Moines, Iowa.

140 tons, shop addition and assembly unit, Reed-Prentice Corp., Worcester, Mass., to United Structural Steel Co., Worcester; E. J. Cross Co., Worcester, contractor.

135 tons, repairs for 50 bridges, various locations, Santa Fe railroad, to American Bridge Co., Pittsburgh.

128 tons, subway under E. J. & E. railroad, North Chicago, Ill., for state, to American Bridge Co., Pittsburgh; bids April 17.

SHAPES CONTRACTS PENDING

Unstated, structures for Units L-4 to L-8 inclusive, 230-kv switchyard, Coulee

G. A. WELDING Shop Notes

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"Fluid - Fusion" Welded Pressure Vessels built to your plans and specifications include such varieties as: Fractionating Columns, Reaction Chambers, Bubble Towers, Absorbers, Digesters, Car Tanks, Creosoting Cylinders, Stills, Propane Tanks, Rotary Kilns, Retorts, Air Receivers, Crystallizers, Agitators, and Dephlegmators. See G. A. for all your steel plate construction needs.

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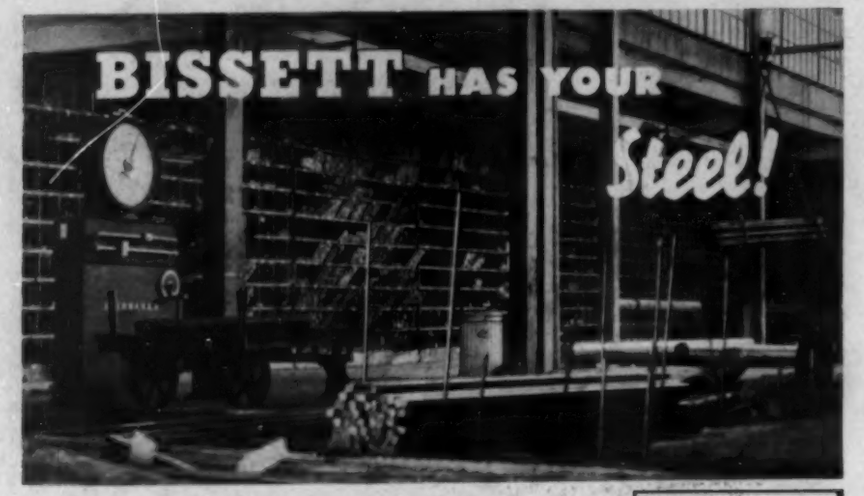

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★ High Speed Tool Bits ★ S.A.E. Steels ★ Shim Steel
★ Strip Steels ★ Spring Steels ★ Tool Steels
★ Tool Steel Tubing

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LEWIN-MATHES Got the right answer at

ETNA

They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

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Etna has the swaging machines from 3/8" to 4" and the experience to help you get the most out of this type of machine.

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ETNA MACHINE COMPANY
TOLEDO OHIO

SHAPE AWARDS COMPARED

	Tons
Week ended July 11	7,332
Week ended July 4	12,700
Week ended June 27	17,720
This week, 1941	14,252
Weekly average, 1942	26,355
Weekly average, 1941	27,284
Weekly average, June, 1942	15,474
Total to date, 1941	829,010
Total to date, 1942	692,580

Includes awards of 100 tons or more.

dam; bids to Denver July 16; Spec. 1650-D.

Unstated, 200 metal corner post steel sections for Alaska Railroad; bids to J. R. Ummel, purchasing agent, Seattle, July 6.

REINFORCING BARS . .

REINFORCING STEEL AWARDS

1200 tons, factory addition, Curtiss-Wright Corp. Airplane Division, New York, to Joseph T. Ryerson & Son Inc., Buffalo.

650 tons, Gopher ordnance plant, Minnesota, for war department, for operation by E. I. duPont de Nemours & Co., to Paper-Calmenson Co., St. Paul.

500 tons, factory addition, Worthington Pump & Machinery Corp., Buffalo, to Bethlehem Steel Co., Lackawanna, N. Y.

360 tons, addition, TNT plant, New York, to Truscon Steel Co., Buffalo.

300 tons, Port of Seattle grain elevator addition; Kuney Johnson Co., Seattle, contractor.

300 tons, addition, Continental Motors Corp., Muskegon, Mich., to Truscon Steel Co., Youngstown, O.

265 tons, factory and office building, Oilgear Co., Milwaukee, to W. H. Pipkorn Co., Milwaukee; A. Schmidt & Son, contractor.

250 tons, factory addition, Worthington Pump & Machinery Corp., Buffalo, to Truscon Steel Co., Buffalo.

223 tons, addition, United States Rubber Co., Detroit, to Taylor & Gaskin Inc., Detroit; J. A. Utley, contractor.

210 tons, factory building, TNT plant, New York, to Bethlehem Steel Co., Buffalo.

200 tons, factory addition, Farrel-Birmingham Co., Inc., Buffalo, to the Bethlehem Steel Co., Lackawanna, N. Y.

150 tons, Vinco Corp., Detroit, to Taylor & Gaskin; Reisdorf & Brewer, contractors.

127 tons, Michigan highway, section B-3 of 81-20-86, to McGraw Co., Detroit; Walter Tobe, contractor.

120 tons, shipbuilding division, Missouri

CONCRETE BARS COMPARED

	Tons
Week ended July 11	4,955
Week ended July 4	38,285
Week ended June 27	1,786
This week, 1941	15,360
Weekly average, 1942	10,309
Weekly average, 1941	13,609
Weekly average, June, 1942	5,460
Total to date, 1941	319,171
Total to date, 1942	273,012

Includes awards of 100 tons or more.

Valley Bridge & Iron Co., Evansville, Ind., to Jos. T. Ryerson & Son Inc.

100 tons, Camp Atterbury, Edenburg, Indiana, to Pollak Steel Co., Cincinnati.

REINFORCING STEEL PENDING

3000 tons, synthetic rubber plant, for Rubber Synthetic Inc.; Stone & Webster, New York, contractor.

1200 tons, wire mesh, airplane engine plant, Chrysler Corp.; George A. Fuller Co., Chicago, contractor; bids July 14.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Central of Georgia, one 1000-horsepower diesel-electric switch engine, to Electro-Motive Corp., La Grange, Ill.

Denver & Rio Grande, six 44-ton diesel-electric locomotives, to General Electric Co., Schenectady, N. Y.

CAR ORDERS PENDING

National Tube Co., thirty 70-ton hopper cars; reported contemplated.

Utah Copper Co., one hundred 100-ton ore cars; reported contemplated.

PIPE . . .

CAST PIPE PLACED

1000 tons, Manette, Wash., housing project, to Marckmann & Williams, Seattle, universal pipe, for Central Foundry Co., New York.

CAST PIPE PENDING

250 tons, 16 and 24 inch, Bremerton, Wash., alternates also; bids July 15.

Unstated, District No. 62 system project at Earlington, Wash.; bids to Gardner, Gardner & Hitchings, engineers, Seattle, July 10.

CONSTRUCTION and ENTERPRISE

Michigan

DETROIT—Cogsdill Twist Drill Co., 6511 Epworth boulevard, has awarded contract to Talbot & Meier, 1000 Larchwood avenue, for one-story 80 x 180-foot factory, to cost $75,000. P. Sewell, 324 McKerchey building, Detroit, engineer. (Noted June 15).

Massachusetts

QUINCY, MASS.—Bethlehem Steel Co., East Howard street, will soon let contract for pipe plant. Estimated cost $40,000.

LYNN, MASS.—General Electric Co. has asked bids for plant costing over $40,000.

Connecticut

BRIDGEPORT, CONN.—Fletcher Thompson Inc., 1336 Fairfield avenue, will soon let contract for two-story factory at Walter and East Main streets for Bridgeport Brass Co., H. W. Stinkrauss, general manager. Estimated cost $250,000.

HARTFORD, CONN. — Bartlett-Brainard Co., 103 Woodbine street, Hartford, has

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A
B
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been awarded contract by an industrial company for manufacturing unit. Estimated cost $1,000,000.

WEST HAVEN, CONN. — Bridgeport Grinding Machine Co. Inc. has let contract to Joseph N. Rice Inc., 60 Peck street, New Haven, for plant.

New Jersey

IRVINGTON, N. J.—General Tool & Mfg. Co., 196 Colt street, will soon let contract for one-story machine shop. P. Mertens, 103 Osborne Terrace, Newark, architect.

JERSEY CITY, N. J.—Public Service Electric & Gas Co., 80 Park place, Newark, has let contract to Becker Construction Co., 361 Grove street, Newark, for altering generator station, and boiler and blower room addition.

Ohio

AKRON, O.—Earnest P. Engstrom, 11 East Miller, is adding considerable space to his factory at 112 South Wilbeth road.

ASHTABULA, O.—New plant projected by Vanadium Corp. of America, New York, near here has been abandoned. Plant of Electro-Metallurgical Co., 30 East Forty-second street, New York, will be enlarged accordingly to increase facilities to equal capacity of the two plants.

CLEVELAND—Industrial Parts Mfg. Co., new tool and parts manufacturing company, is being incorporated through Attorney J. L. Weisend, Hanna building.

CLEVELAND—Federal Gear Co., Forrest C. Clough, president, is adding 3360 square foot shop building to plant at 1754 East Forty-seventh street.

CLEVELAND—Ohio Crane Engineering Co. is being incorporated through Ben P. Bloom, Standard building, attorney, to manufacture tools, dies, cranes and machinery.

CLEVELAND — Superior Construction Co., Julius Linder, 2320 Ogontz avenue, will soon start work on addition of 4800 square feet to office and factory of a Cleveland manufacturer.

CLEVELAND—Federal Foundry & Supply Co., Ralph Ditty, president, 4600 East Seventy-first street, will establish plant in western Pennsylvania.

CLEVELAND — Ferro Enamel Corp., Robert Weaver, president, 4150 East Fifty-sixth street, has let contract to Dean W. Rankin Co., 1836 Euclid avenue, for $200,000 cobalt plant in Cuyahoga Heights.

DOVER, O.—Sparklet Devices Inc., Newark, N. J., will establish $375,000 war industry here in former roofing shop building of American Sheet & Tin Plate Co.

TOLEDO, O.—Willever Piston Co. recently sustained damage by fire to motors, belts and lathes.

WADSWORTH, O.—Diamond Match Co., Second street, Barberton, O., sustained considerable loss when flare factory here was damaged and machinery and equipment destroyed by fire recently.

WASHINGTON COURT HOUSE, O.—A $2,500,000 plant for production of airplane parts will be established here with purchase of the recently completed plant of the Furnace Foundry Co. by the Aeronautical Products Co., Detroit. D. W. Norris, president of the furnace company, states his company plans to duplicate the present plant as soon as possible.

Pennsylvania

BLAIRSVILLE, PA. — Porter-Blairsville Co., division of H. K. Porter Co., P.O. Box 168, has awarded contracts for two factory buildings and alterations costing over $60,000. F. Andre, Forty-ninth street and Harrison avenue, Pittsburgh, construction engineer. (Noted July 6).

MILLVALE, PA.—E. T. Lippert Saw Co., E. B. W. Pfishner, president, has awarded contract to F. F. Pschirer, 653 North avenue, for one-story 90 x 90-foot steel factory. (Noted July 6).

PITTSBURGH—Jones & Laughlin Steel Corp., F. W. Ochsenhirt, purchasing agent, Jones & Laughlin building, has plans for one-story steel plant extension. Estimated cost $100,000.

Illinois

CHICAGO—General Engineering Works, 4701 West Division street, will start work soon on one-story 60 x 128-foot addition. Niestadt & Love, 343 South Dearborn street, architects.

CHICAGO—Bosworth Foundry Inc., 111 West Jackson boulevard, has been incorporated with 5000 shares of common stock by J. J. Melbrod, G. P. Beringer, and J. A. Schulz, to deal in metal products, machinery and machine parts. Correspondent: James F. Wade, 111 West Jackson boulevard.

Indiana

FORT WAYNE, IND.—Bass Foundry & Machine Co. has let contracts for welding shop. Pohlmeyer & Pohl-

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meyer, architects, are supervising the work.

Maryland

FAIRFIELD, MD. — Industrial company will soon let contract for three one-story service buildings and office building estimated to cost $75,000. J. E. Greiner Co., 1201 St. Paul street, Baltimore, architect and engineer.

Tennessee

KINGSPORT, TENN.—Tennessee Eastman Corp. has contract for constructing $3,000,000 manufacturing plant.

Louisiana

NEW ORLEANS—Albert Kahn Associated Architects & Engineers Inc., 345 New Center building, Detroit, will soon let contract for plant here.

Missouri

JOPLIN, MO.—Peerless Machinery Co., Fourth street and Michigan avenue, has started work on addition to plant to increase capacity.

KANSAS CITY, MO.—North American Aviation Inc. is considering plans for enlargement of bomber plant to cost $3,000,000.

Wisconsin

LAKE, WIS.—Screw Machine Products Co., 4051 South Iowa street, has let contracts for 80 x 130-foot plant addition.

MILWAUKEE—Milwaukee Tool & Die Co., 4040 East Thirty-fourth street, has let contracts for one and two-story factory. (Noted May 11).

MILWAUKEE—Doelger & Kirsten Co., 3015 West Chambers street, has let contract for one-story machine shop addition to Meredith Bros., 121 East Washington street. Cost estimated at $40,000.

Minnesota

MINNEAPOLIS — Minneapolis-Honeywell Regulator Co., 2753 Fourth avenue, has let contract for remodeling factory to Naugle-Leck Co., 522 Roanoke building. (Noted June 1).

RUSHFORD, MINN. — Dairyland Power Co-operative, Arcadia, Wis., will improve and enlarge power plant here. Estimated cost $45,000.

Texas

ABILENE, TEX.—City has FWA allotment of $176,208 for water and sewers.

CORPUS CHRISTI, TEX.—T. A. Applewhite, 909 Hancock street, has contract for machine shop at 105 South water street for C. E. Russell.

EL PASO, TEX.—City has FWA allotment of $285,350 for sewage facilities; city to furnish $210,350.

FORT WORTH, TEX.—City, Sam H. Bothwell, city manager, has plans for enlargement of sewage plant, for which it has allotment of $437,000. Freese & Nichols, 409 Capps building, consulting engineer.

Iowa

CLINTON, IOWA—Clinton Products Co., W. F. Powers, president, will erect alcohol plant costing approximately $50,000.

CLINTON, IOWA—Gateway Brewing Co. has awarded general contract for plant to Clinton Engineering Co. Estimated cost $150,000.

Utah

LEHI, UTAH—Emsco Corp., South Gate, Calif., will soon let contract for silica brick plant here costing $700,000. Holmes & Narver, 639 South Spring street, Los Angeles, engineer.

Montana

BUTTE, MONT.—Anaconda Copper Mining Co. has awarded contract to Cahill-Mooney Construction Co., Butte, for mill building.

California

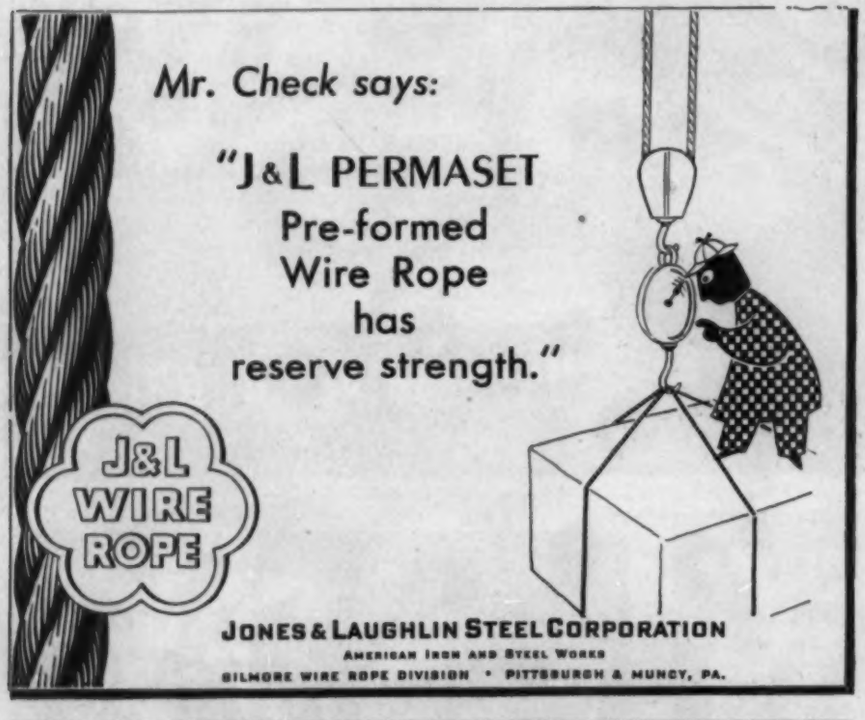
HOLLYWOOD, CALIF.—Precision Screw Products Co. is the firm name under which Howard A. Schonrock, John Weisbiski and William H. Jobe have obtained certificate to conduct business at 6801 Melrose avenue, Hollywood.

HUNTINGTON PARK, CALIF.—Pacific Fabricating Co., 1911 East Fifty-first street, Vernon, Calif., has awarded contract to E. S. McKittrick Co., 7839 Santa Fe avenue, Los Angeles, for factory to cost over $40,000.

LOS ANGELES—G. & L. Machine Products Co. is the firm name under which Henry J. Graves and Taylor Lucas have obtained a certificate to conduct business at 4500 South Main street.

LOS ANGELES—De Luxe Machine & Tool Co., 5725 South Avalon boulevard, has been organized by Robert H. Morris and F. J. Morris.

LOS ANGELES—Baash-Ross Tool Co., 5512 Boyle avenue, is erecting a ma-



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chine shop costing $12,000.

LOS ANGELES—Plans are being prepared for machine shop and tool works at 2431 East Fifty-sixth street for J. R. Tool & Mfg. Co., to cost $12,000.

LOS ANGELES—Economy Nut Anchors Inc. has been organized with $25,000 capital by C. N. Delano, Paul G. Tucker and R. L. Faulds. Corporation is represented by Mr. Faulds, 605 South Vermont avenue.

LOS ANGELES—United Marine Mfg. Co. has been organized with $100,000 capital. Corporation is represented by R. J. Kilpatrick, 1013 Heartwell building, Long Beach, Calif.

LYNWOOD, CALIF. — Western Gear Works has awarded contract to Modern Construction Co., Long Beach, Calif., for 80 x 240-foot assembly building, 24 x 109-foot service building and 40 x 106-foot personnel building. Cost over $40,000. J. H. Davies, Ocean Center building, Long Beach, engineer.

Washington

TACOMA, WASH.—Long Foundry Co. has been incorporated with $24,000 capital by Joe L. Long and associates to operate foundry and machine shop.

Canada

VANCOUVER, B. C.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has given general contract to Smith Bros. & Wilson Ltd., 1267 Richards street, Vancouver, for repair depot at Jericho Beach to cost $537,000. Department has also given contract to Northern Construction Co. and J. W. Stewart Ltd., for repair depot at Katsilano to cost $782,000.

SYDNEY, N. S.—Dominion Steel & Coal Corp. Ltd., is considering plans for further addition to its works here to cost about $200,000, equipment to include ten-ton overhead electric magnet crane and rolling mill equipment.

COLLINGWOOD, ONT. — Collingwood Shipyards Ltd., Huron street, J. S. Leitch, general manager, is receiving bids for foundry and moulding shop addition to cost about $60,000, with equipment. Richards & Abra, 55 Metcalfe street, Ottawa, architects.

GALT, ONT.—Surley-Dietrich-Atkins Co. Ltd., Glebe street, is having plans prepared for further plant additions to cost about $75,000 with equipment.

GUELPH, ONT.—Leland Electric, Canada Ltd., 50 Crimea street, has taken bids through Mahoney & Austin, architects, 79 Quebec street, for plant additions, for enlargement to tool room, punch press department and shaft turning department.

KINGSTON, ONT.—Kingston Shipbuilding Co. Ltd., Ontario street, will proceed with further plant addition here to cost $20,000. Transformer house to cost $15,000 will also be erected. Plant addition now underway includes $75,000 machine shop to house equipment costing $125,000, for which Hill-Clark-Francis Ltd., New Liskeard, Ont., has general contract.

LEASIDE, ONT.—Canada Wire & Cable Co. Ltd., has given general contract to R. J. Hibbs Construction Ltd., 15 Trent avenue, Toronto, for plant addition costing $60,000 with equipment.

OTTAWA, ONT.—Department of Munitions and Supply, H. H. Turnbull, secretary, is taking bids for ordnance building. Plans call for building 300 x 1000 feet to cost about $750,000 with equipment.

RENFREW, ONT.—Renfrew Electric & Refrigerator Co. Ltd., Elizabeth street, has given general contract to M. J. Sulpher & Son, Lisgar street, for plant addition.

SARNIA, ONT.—Polymer Corp. Ltd., 320 Bay street, Toronto, and Canadian Synthetic Rubber Ltd., care of A. G. Partridge, 204 Richmond street West, Toronto, will start work soon on synthetic rubber plant to cost about $1,000,000. Plans by H. G. Acres & Co., 2135 Culp street, Niagara Falls, Ont.

TORONTO, ONT.—Peerless Engineering Ltd., 11 Charlotte street, is having plans prepared for factory on Brandon avenue to cost about $50,000 with equipment.

TORONTO, ONT. — Dominion Solders Ltd., recently incorporated, has acquired plant at 300 Howland avenue, which will be equipped for manufacturing purposes. Equipment to include special gas furnaces.

WINDSOR, ONT.—Bendix Eclipse of Canada Ltd., 1473 Argyle road, is having plans prepared by Sheppard & Masson, architects, 52 Chatham street West, for addition to plant unit to cost about $180,000 with equipment.

QUEBEC, QUE.—Dominion Oxygen Co. Ltd., 150 Bay street, Toronto, is having plans prepared for plant to cost about $165,000 with equipment.

THREE RIVERS, QUE.—Canada Iron Foundries Ltd., Sun Life building, Montreal, has given general contract to Joseph Renaud, 145 Laviolette street, for plant addition to cost about $25,000 with equipment.

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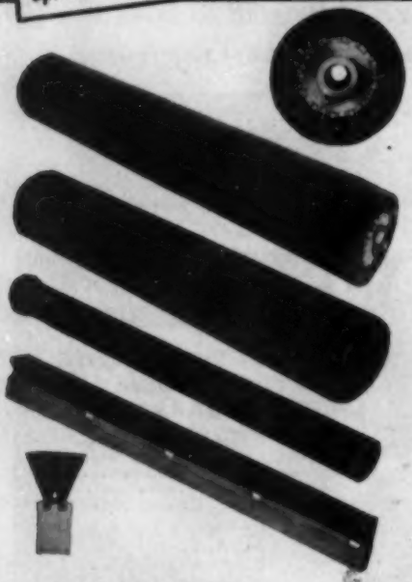

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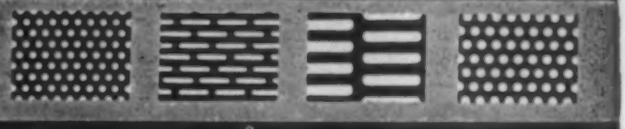

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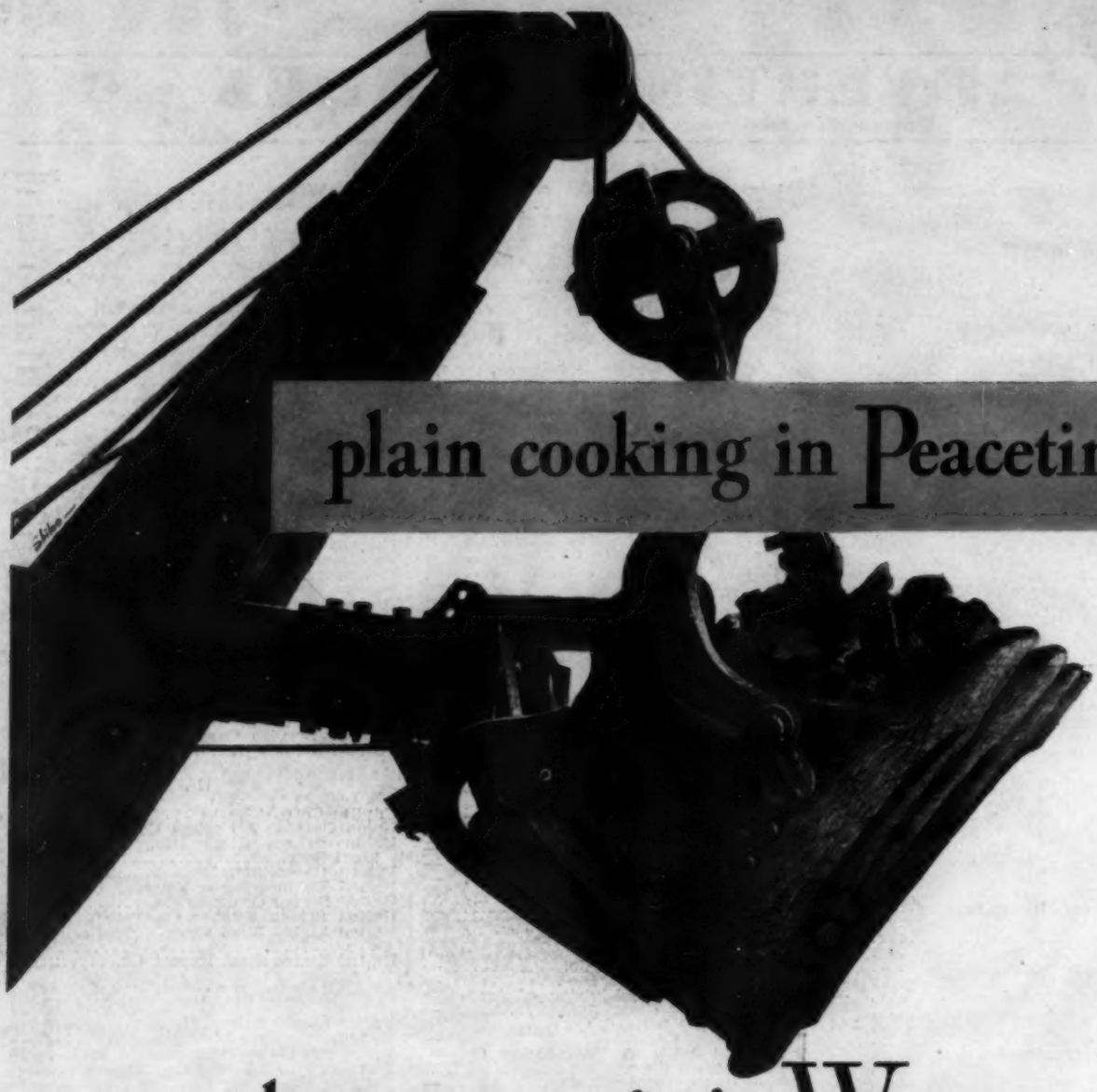

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